

MINING WORLD



In this issue

Block Caving at Miami

Page 26



ROUGH ROCK LOADING
 is easy with an Eimco loader. They're made especially for rock loading and all Eimco loaders give years of dependable service.

EIMCO
 THE EIMCO CORPORATION

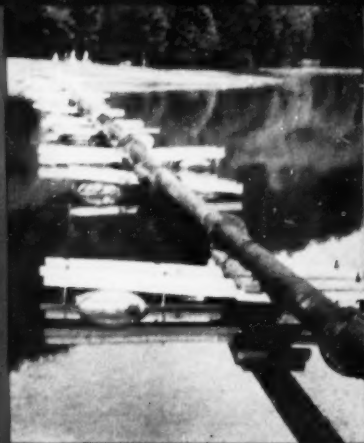
The World's Largest Manufacturer of Self-Propelled Rock Loading Machines
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OCTOBER, 1952

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35 cents a copy
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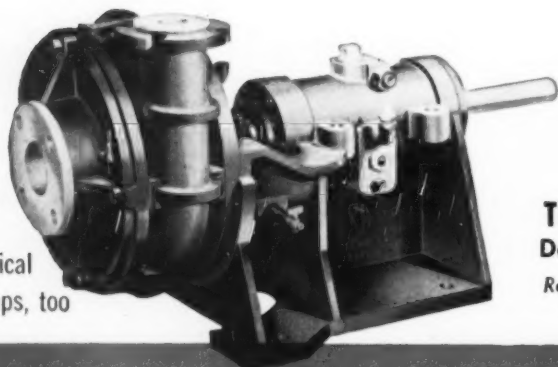
Nothing gets around

like a pipeline

There isn't another kind of materials handling that offers as much flexibility as pumping. That's because pipelines can go under roads, over streams, and up cliffs. In fact, you can find all of these conditions in many individual Hydroseal jobs. No need to worry about the weather, either, because pumping can handle your materials when other methods of transportation are stopped

cold. For another thing, it's a one-way system — you don't pay for the empty return trips of cars or trucks.

We think you'll be pleased to find out how much you can save by doing your hauling with Hydroseals. Write for Catalog No. 552.



Vertical pumps, too



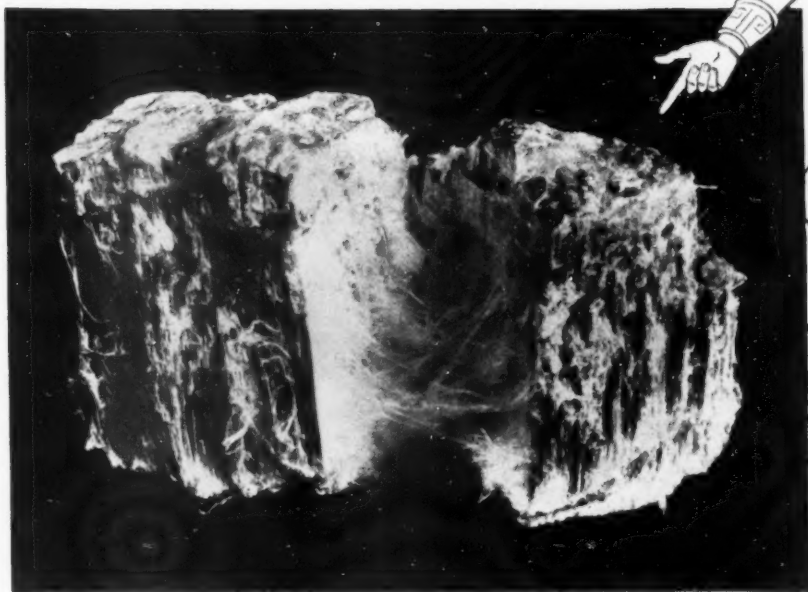
THE ALLEN-SHERMAN-HOFF PUMP CO.
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HYDROSEAL

SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

"Threads of Gold" for a ROMAN TOGA

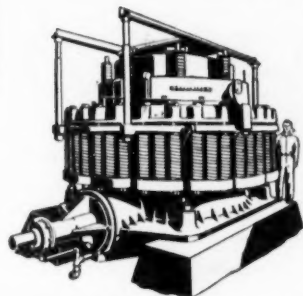


The mineral *Chrysotile*, meaning golden fibers, or threads, supplies over 90% of the world's asbestos requirements. Called the "miracle mineral" by the ancients, the Roman naturalist Pliny (23-79 A.D.) refers to the use of such material as "a rare and costly cloth" used for the funeral garments of kings.

The secret of the great usefulness of asbestos lies in its unique combination of fibrous structure, fire and water resistance, flexibility and strength. Since the profitable recovery of asbestos fiber depends upon fine crushing without destroying fiber length, a crusher that will perform such functions economically, and will produce large quantities of finely crushed material, is essential.

Proof of the world-wide acceptance of "SYMONS" Cone Crushers in asbestos production is found in the field, where practically every major producer employs these high capacity, economical machines . . . as in all of the great ore and industrial mineral operations the world over.

NORDBERG MFG. CO., Milwaukee, Wisconsin



"SYMONS" Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

C252

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Primary
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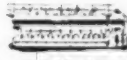
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"SYMONS"
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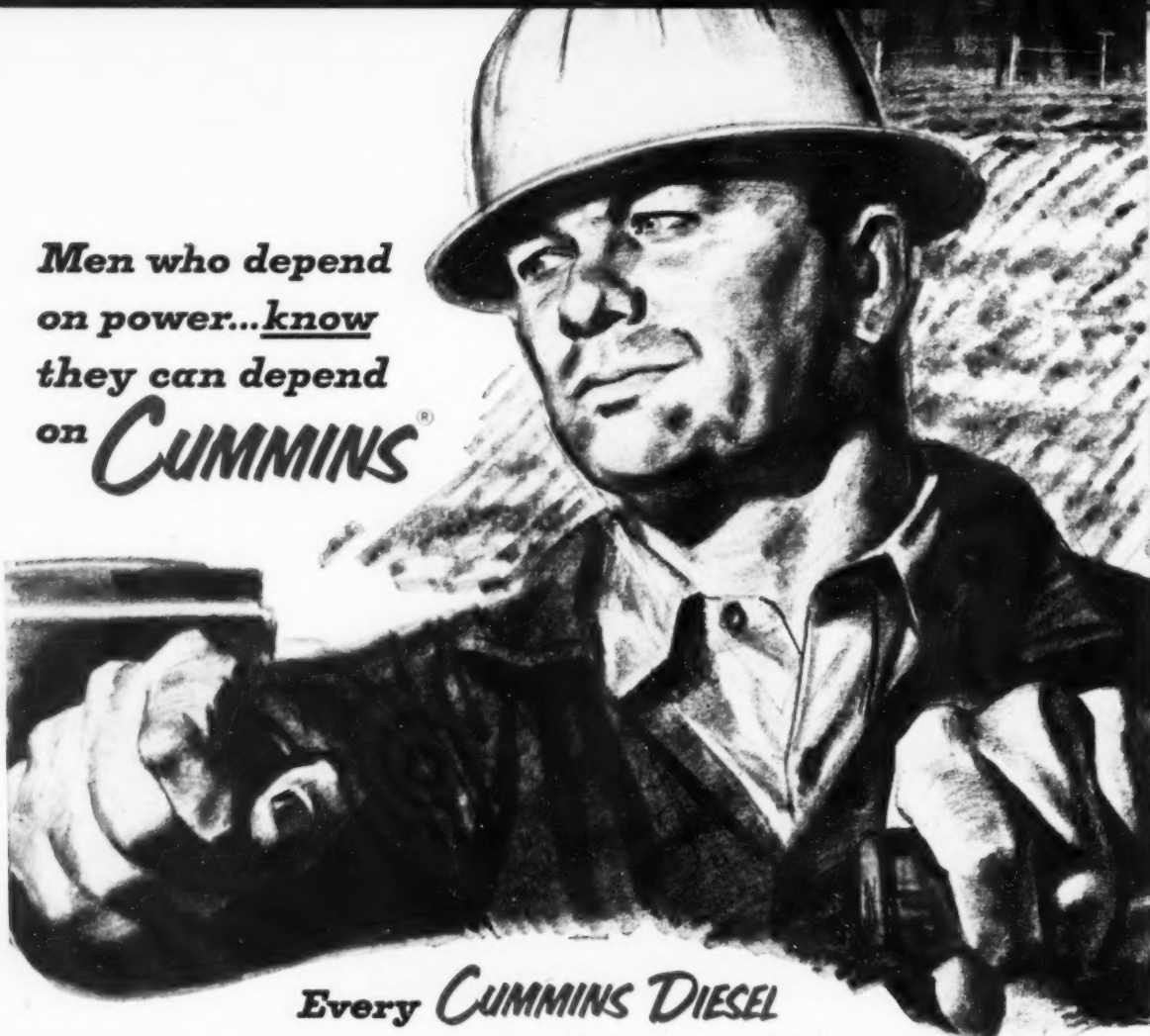
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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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Men who depend
on power...know
they can depend
on **CUMMINS**[®]



Every **CUMMINS DIESEL**
is built not once but twice



Miners have learned to count on Cummins Diesels for dependable power day in, day out. What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice for men who depend on power.

Whatever your power needs... whether it's for stripping or hauling, portable power units or generator sets... or any other important jobs... your Cummins dealer is the man to see.

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NEW BULLETIN NO. 232 TELLS HOW...

DOUBLE-SLUSHING IS ELIMINATED!

This new bulletin contains the latest information and operating instructions on the Pacific Round-The-Corner Sheave Block. Large, clear, action pictures (courtesy of Bunker Hill and Sullivan Mining and Concentrating Co., Kellogg, Idaho) show a two-drum hoist pulling a fully loaded Pacific "Slushmaster" Scraper around a 90° turn.

The Pacific RTC is an entirely new product which is now enabling a great number of mining companies to cut their cost of mucking operations in half. We would like to have every underground operator study this new bulletin and see the pictures which show exactly how it works. It has been printed in quantity and we will send you enough copies to cover each interested man on your team. Mail coupon today.

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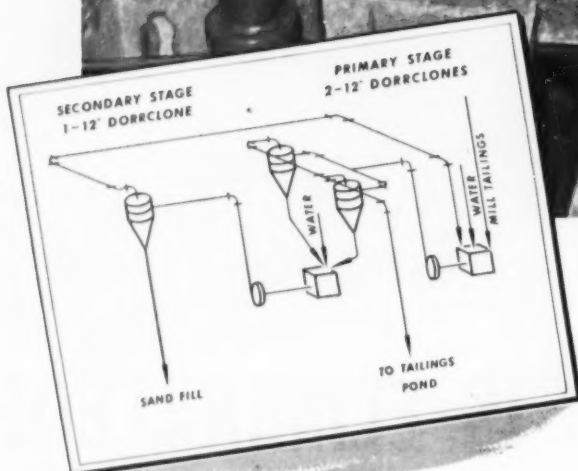
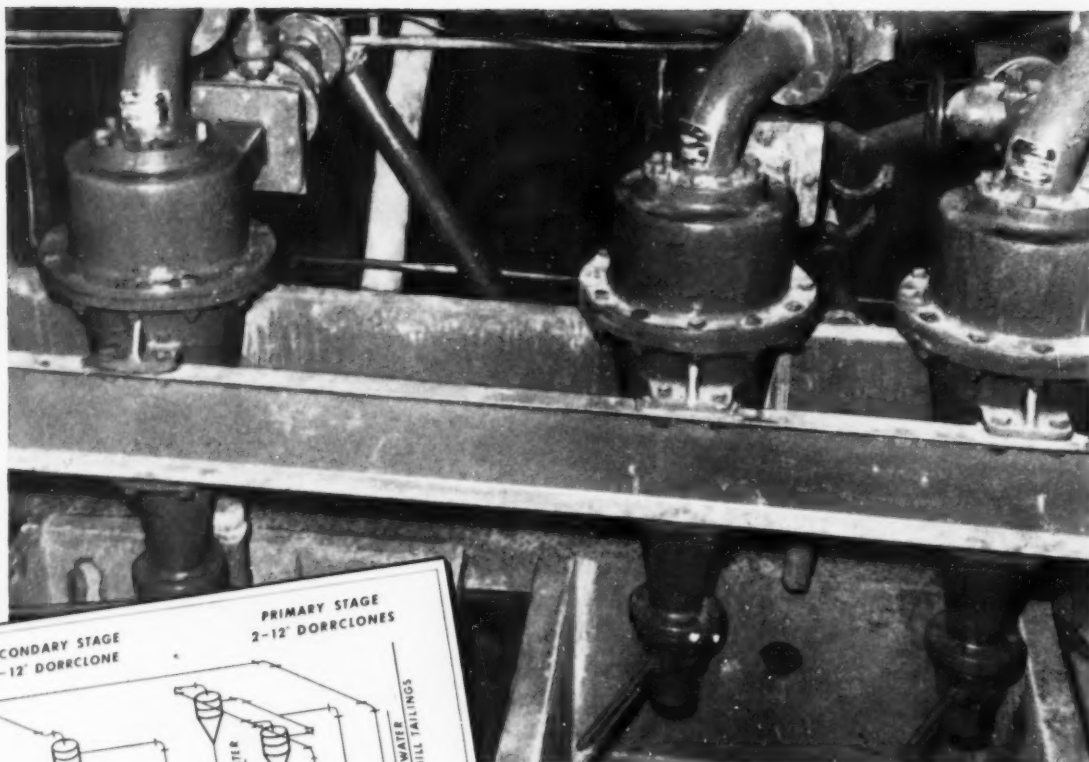
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Mailing address, Box 15323 Vernon Station, Los Angeles 58



For Producing Mine Backfill From Mill Tailings...

Madsen Red Lake Gold Mines uses two stages of DorrClones* for maximum flexibility

From a 3" test DorrClone to the installation of three 12" dia. units. That's the story at Madsen Red Lake, one of Canada's most modern gold producers. Using a two-stage flowsheet as shown in the accompanying sketch, the DorrClones are producing 120 tons per day of fill with a percolation rate of 4-6 in/hr.

Key to this two-stage DorrClone setup is flexibility. While the units are in continuous operation, simple adjustments can be made to produce any type of fill from practically any composition of mill tailings. To illustrate this flexibility, three tests were made at Madsen Red Lake yielding the following results:

*T.M. Reg. U. S. Pat. Off.

	TEST A	TEST B	TEST C
New feed to primary stage, TPD	330	298	330
% solids to DorrClones	21.2	21.4
Sand Fill Produced, TPD	251	167	120
% solids	49.5	57.0	62.5
Percolation rate, in. per hr.	2.75	6.75	11.5

(Tests were made consecutively without shut-down)

Regardless of your particular mining operation, tailings composition or fill requirements, The DorrClone is an ideal tool with which to solve backfill problems. Write for a copy of bulletin No. 2500 to The Dorr Company, Stamford, Conn., or in Canada, to The Dorr Company, 80 Richmond Street West, Toronto 1.



Better tools TODAY to meet tomorrow's demand

DORR

WORLD - WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.
Offices, Associated Companies or Representatives in principal cities of the world.





P&H
MODEL
955-A

P&H MAGNETORQUE*

is the electric swing
that never wears out

Just what does Magnetorque mean to you in this great 2½ yd. shovel? Simply this: It eliminates the old swing frictions with their constant headaches and replacement costs. It gives you the smoothest, slickest swing you ever saw—15% to 25% faster than any other machine of its size—and Magnetorque will last the life of your machine.

Add to this the rugged, rock-rated construction of welded high tensile steels—the

smooth hydraulic control—the greater stability and digging power—and you have the greater output which means greater profit. Better get all the facts about this outstanding machine—companion to the famous P&H 1055 (3½ yds.). Ask about the P&H 955-A today.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

HARNISCHFEGER
CORPORATION

4400 W. NATIONAL AVENUE • MILWAUKEE 14, WISCONSIN

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LIMA

Wheel or truck mounting is available on machines of $\frac{3}{4}$ and $1\frac{1}{2}$ yards capacity.



THE ALL PURPOSE MACHINE

Here are four typical examples of the versatility of the LIMA Type 604. Realizing that most contractors bid various types of work, LIMA has gone to great lengths to make a machine that is easily converted in the field to shovel, crane, dragline or pullshovel, thus giving the owner the advantage of four machines in one.

Versatility is but one of the many advantages that make the Type 604 a leader in its class. For instance, air controlled clutches do all the work—with one slight touch of the levers, the hoist, crowd, travel

and swing clutches can be engaged or disengaged, making for ease of operation. Anti-friction bearings in the drums and other important bearing points reduce destructive friction and lessens lubrication problems. Simplicity of design results in fewer working parts and greater safety for the operator.

For further information on the Type 604, write your nearest LIMA distributor or write to Baldwin - Lima - Hamilton Corporation Construction Equipment Division, Lima, Ohio, U. S. A.

CAPACITIES: Shovels $\frac{3}{4}$ to 6 cu. yds. Cranes to 110 tons. Draglines, variable.

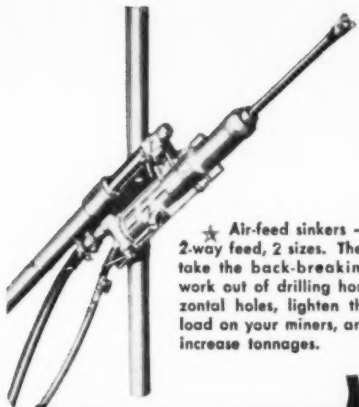
CABLE ADDRESS, LIMA SHOVEL

OFFICES IN PRINCIPAL CITIES OF THE WORLD

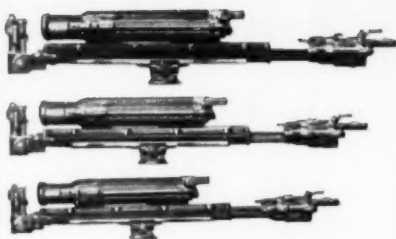
BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES
CRUSHING • WASHING AND SCREENING EQUIPMENT





★ Air-feed sinkers — 2-way feed, 2 sizes. They take the back-breaking work out of drilling horizontal holes, lighten the load on your miners, and increase tonnages.



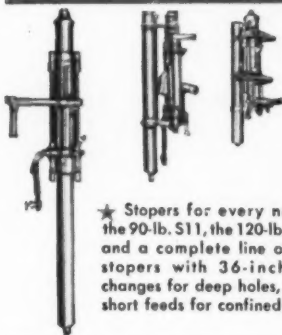
★ Power-feed and hand-cranked drifters. Dependable, powerful, and fast. Ideal for columns and jumbos alike.



★ A complete line of sinkers from 18 to 80 lbs. including the popular 45-lb. H10, and 55-lb. H111.



★ The SDR 34 shaft sinker for faster shaft sinking. Fully closed it's 5'6" between drill centers; open 19'3". All adjustments quickly made with air motor.



★ Stopers for every need — the 90-lb. S11, the 120-lb. SS-22, and a complete line of offset stopers with 36-inch steel changes for deep holes, or with short feeds for confined spaces.

It's Le Roi-CLEVELAND

for

Rock Drills You Can Count On

... fast-drilling, dependable favorites of mining men since 1906

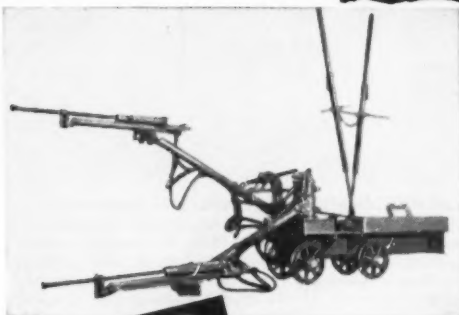
Of course, you know that Le Roi-CLEVELAND builds the popular, easy-holding H10 and H111 sinkers... the fast-drilling PD24, 25, and 14 power feed drifters... the S11 and SS22 stopers with trip rotation for easier handling... and a mine jumbo that lets you drill out your rounds faster, with greater safety.

But did you know that Le Roi-CLEVELAND was responsible for some famous "firsts"? Here are a few of them—work-savers that help your miners increase their man-shift pro-

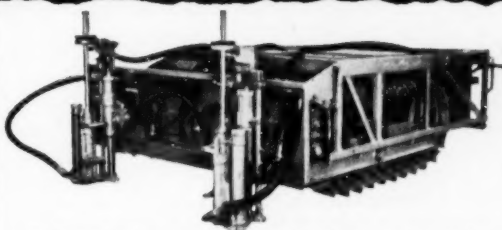
duction: the air-feed sinker, the offset stoper, the shaft sinker, the stoper jumbo.

So if you have a job of drilling to do—do it with Le Roi-CLEVELAND machines. You can count on them. They're built for speed. And they're built to stay underground, too — where you can use this speed to do more work and cut your costs.

Detailed information about the complete Le Roi-CLEVELAND rock drill line is yours for the asking. Just write us.



★ The famous MDR Jumbo with air-motor powered booms for quicker set-ups, greater safety, faster rounds.



★ Stoper jumbo — self-propelled with its own integral dust-collection system for positive dust control, the latest thing for roof bolting.



LE ROI COMPANY

RD-39

CLEVELAND ROCK DRILL DIVISION

12500 Berea Road, Cleveland 11, Ohio

Plants: Milwaukee, Cleveland and Greenwich, Ohio

JOB PROVED

Always on the alert for new and better methods, progressive dirtmovers everywhere are modernizing their pushing, pulling and dozing tasks with LeTourneau high-speed Tournadozers. Rolling on big rubber tires instead of on steel tracks, Tournadozer provides speed and mobility never before available for your pit operations. Tournadozer goes anywhere under its own power—shovel to shovel, pit to dump, plant to stockpile. It travels fast over any terrain, on pit roads, along or across railroad tracks, or over paved highways. Because it can thus utilize waiting time for productive assignments, one Tournadozer can often replace 2 or more slow-going crawler dozers.

Twice as fast as crawlers

Wherever it goes Tournadozer "runs" at a fast 19 m.p.h. clip instead of "crawling" at 5 to 8 m.p.h. Then, too, your dirtmoving cycle is greatly speeded

up by its 8 m.p.h. reverse speed on the return half of the cycle. Instantaneous shift eliminates slowdown or loss of momentum when shifting gears.

Big 21.00 x 25 low-pressure tires give you greater traction and increased flotation in sand, mud, snow or on ice. Tournadozer's 186 h.p. coupled to 4-wheel drive moves heavier loads on the level, up steep grades, or through soft footings.

Tournadozer has many other advanced mechanical features—including fingertip electric steering, shifting, and blade controls . . . constant-mesh transmission . . . multiple-disc air brakes . . . torque converter . . . and down-pressure blade.

No matter where you are located, it will pay you to get all the facts on how modern, rubber-tired Tournadozer can increase your production and reduce costs. For complete information, write or call your LeTourneau Distributor.



In Chile, STOCKPILES NITRATE—At Port of Iquique, Tournadozer speeds bulk storage and simplifies handling of huge quantities of nitrate while working inside and around the outside of two \$8,000-ton capacity storage plants. Big-capacity blade easily moves more than 2½ yards of bulk nitrate on each trip from the conveyor, then rehandles it for delivery through hatchways to dock conveyor. High-speed reverse (8 m.p.h.), approximately twice that of most crawlers, is an important time saver on this shuttle-type operation.



In Mexico, PIONEERS HIGHWAY—For a new super-highway connecting Mexico City and Acapulco, 6 rubber-tired Tournadozers, owned by Constructora Juarez de Mexico, S.A., are speeding initial clearing and pioneering of the rocky 5,500,000-yd. right-of-way. These 19 m.p.h. Tournadozers are removing rock, brush and stumps to smooth the grade ahead of the trucks, shovels and scrapers which are handling final excavation. Big 4-wheel air brakes (2822 sq. in. braking surface) gives operator complete safety on hills.

D Tournapull
prime mover
also powers

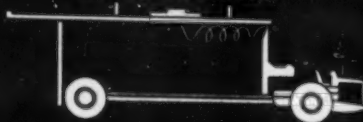
9-TON REAR-DUMP

Turns around in radius of 12'4"
dumps load electrically



10-TON FLATBED

Lifts load by means of
traveling overhead hoist



10-TON CRANE

Carries full load anywhere.
No outriggers needed.



from Tropics to Arctic Circle



In Norway, MAINTAINS MINE HAUL ROADS—
To uncover magnetite ore at Kirkenes, Norway, open pit mine, 215 mi. north of the Arctic Circle, Sydvaranger, A/S — well-known Oslo firm — assigned the removal of approximately 25,000,000 yds. of rock to 12 Tournadozers

and 2 high-speed Tournadozers. Working year-around in temperatures as low as 31° below zero, Tournadozers build and maintain haul roads from mine to crushing plant, and handle clean-up around all shovels in the pit.



In Minnesota, HANDLES SCATTERED ODD-JOBS—Stanley Mining Company, Biwabik, Minnesota, operates its ore pit, crusher, and washing plant 24 hours a day, 7 days a week. Mining taconite which must be crushed, screened, and processed — the company found Tournadozer was its best tool for handling scattered dozing jobs. In addition to shovel clean-up, Tournadozer maintains rock dump, cleans spillage at crushing plant, and feeds hopper from surge pile. Rig does work normally handled by 2 to 3 crawlers.



In Venezuela, STOCKPILES SAND AND GRAVEL —Compania Anonimo Camines uses its Tournadozer for a variety of pushing, pulling and dozing tasks near Puerto La Cruz, Anzoategui. Besides pulling a R-roter and Flatbed trailer, push-loading Tournapulls, and backfilling pipe at the 740-acre refinery, Tournadozer stockpiles sand and gravel for the project's concrete plant. Rig's big blade and 4-wheel 186 h.p. push easily handles heavy materials . . . keeps mixer continuously supplied for uninterrupted operation of company's plant.

R. G. LeTOURNEAU, INC.
Peoria, Illinois





CONVEYING Systems

for distributing, segregating
and reclaiming ore—
at LOW COST per TON



S-A engineers cooperated with the engineering staff of the Utah Construction Company, Iron Springs, Utah, in designing and equipping this efficient ore handling and processing plant. An important feature is the 36" by 500 foot elevated storage belt conveyor, equipped with a self-propelled tripper to place various grades of ore in designated areas under the trestle. Ore is reclaimed by an S-A Tunnel Conveyor.

Belt Conveyors
Belt Trippers
Belt, Pan & Plate Feeders
"AMSCO" Steel Pan Feeders
Ship Loading Boom Conveyors
Stacking Conveyors
Storage & Reclaiming Systems
Flight & Chain Conveyors
Screw Conveyors
"Natural Frequency" Vibrating Conveyors
REDLER Conveyor-Elevators
ZIPPER Conveyor-Elevators
Conveyor Belt Cleaners
Headshaft Holdbacks
Grizzlies & Screens
Centrifugal Pilers
Bin Gates & Tunnel Gates
Car Pullers & Spotters
Hoists & Winches
Bucket Elevators
Skip Hoists
SealMaster Ball Bearing Units

• Write for a bulletin on any of the above.

• Whether you need a highly specialized conveying-distribution system or simply more efficient ore handling at lower cost per ton—an S-A engineer can help you find the right method and the right equipment *to do your job best.*

In planning with you, he draws upon more than half a century of S-A experience. During that time, thousands of bulk handling problems have been solved—thousands of S-A installations engineered to meet widely varying requirements—some of them undoubtedly similar to yours.

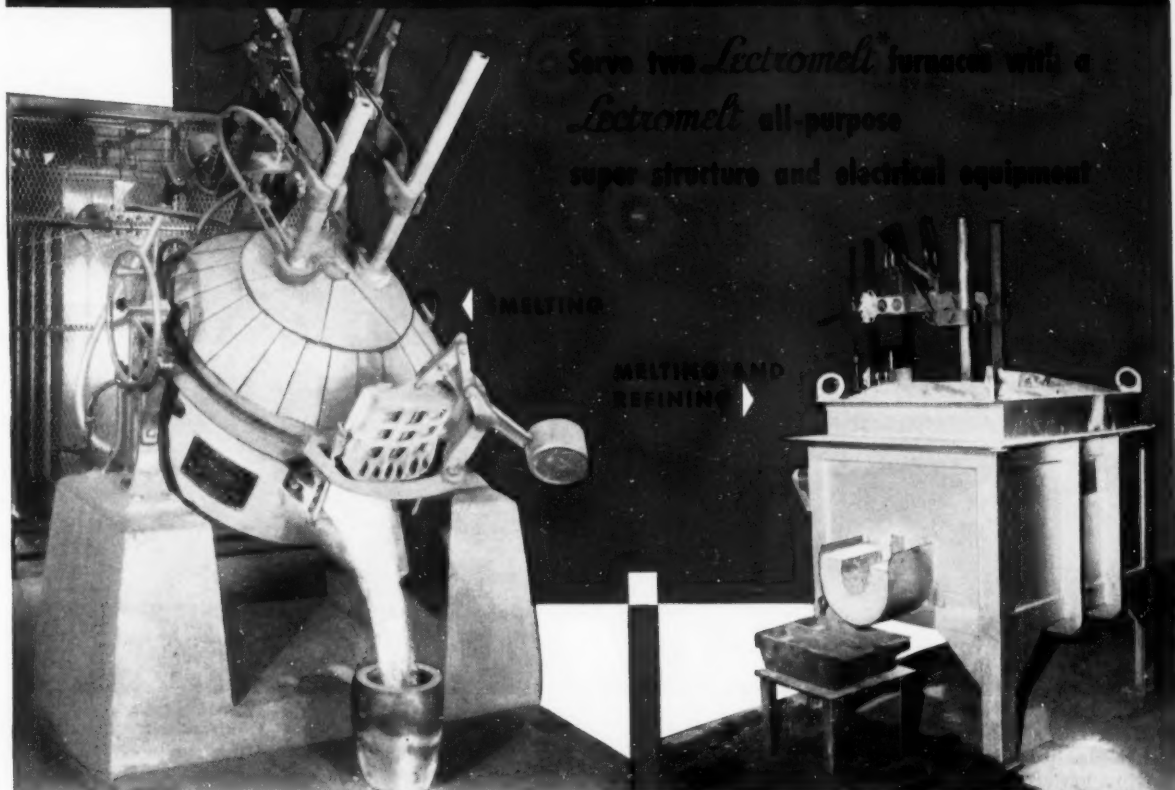
S-A is equipped to meet ever-new demands—the most complete line of equipment assures you an unbiased recommendation. Write us for full details.

STEPHENS-ADAMSON
MFG. CO.

13 Ridgeway Avenue, Aurora, Illinois Los Angeles, Calif., Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

Save money in outfitting your laboratory



With these two furnace shells and the one Lectromelt superstructure, your laboratory can handle almost any problem having to do with electric furnace operations. The superstructure can be shifted from one furnace to the other, as required, along with its electrical equipment.

The combination at the left is designed for small scale, batch smelting of ores and concentrates, melting of non-metallics, melting and refining of metallics. The furnace at the right can be used for continuous operations in experimenting on the

reduction of ores and melting of non-metallics.

Both furnaces can be employed with direct and indirect arcs. 50 KVA of power is available on low voltages and 100 KVA on high voltages.

Lectromelt engineers have been conducting continuing research for many years on electrothermic reductions, so they can help you put these laboratory furnaces to work proving new processes or improving the old ones. For Catalog No. 104 telling you about this service, write Pittsburgh Lectromelt Furnace Corp., 324 32nd Street, Pittsburgh 30, Pa.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

REG. U. S. PAT. OFF.

WHEN YOU MELT... **MOORE RAPID**
Lectromelt



FOR A ROCK BUSTING SHOVEL

GET

AIR CONTROLS
and **HYDRAULIC**
COUPLING



...IN THE **LORAIN 820**

HERE'S WHY! Rock busting takes guts in a shovel. It takes plenty of power—plus a design that can stand up against battering-shattering impacts. That's why you need—and should demand—these two, outstanding, important Lorain-820 features.

The finger-tip control of Lorain "Air-Assist" on crowd, retract and travel clutches makes it *easy* on the operator—yet retains the full "feel" of the machine so necessary for fast production in rock. Full air control of tread lock, steering, crowd brake, and jaw clutches lessen operator fatigue, increase yardage. And the final touch—a typically Lorain design bonus—is that all air controls are equipped for mechanical or manual auxiliary operation.

There's *immediate* take-over—no lost time.

Handle Rock?—why a Lorain 820 is just made for it. Air does the work—and the Lorain Hydraulic (fluid drive) Coupling takes the "shock out of rock" to give the smoothest operation—without operator fatigue—with less strain

on the machine. Digging shocks and impacts "melt away"—just can't be transferred into the mechanism and cables. The engine "never-says-die" . . . it hangs on until the most unyielding rock is in the dipper.

There are many more 820 features that make it worth your while to investigate this leader of the 2-yard shovel class. To be sure of a "rock buster" (not a shovel buster), get the Lorain-820 story from your Thew-Lorain Distributor—real soon!

THE THEW SHOVEL CO., LORAIN, OHIO
FREE BOOKLET...

If your work calls for a *big* rubber tire crane, get your copy of the new booklet picturing mighty 45-ton Lorain Moto-Cranes, model MC-824, in action. It's a picture book of the world's largest crane on rubber . . . on big jobs across the country. Be sure to get a copy of this unusual job booklet.



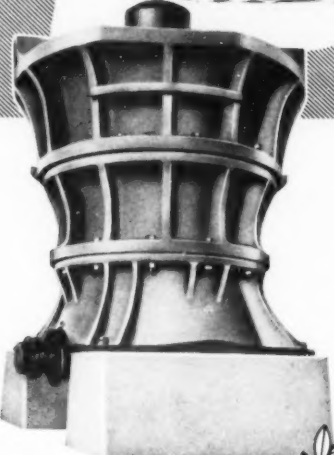
THEW **LORAIN**®

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES
HOES • MOTO-CRANES





Two men on a treadmill
 worked hard to grind a small quantity of ore with this 16th century rig. A historical curiosity today, it was once considered a highly efficient machine.



The Traylor TC Gyratory, with its curved concaves and bell head, incorporates proven principles of advanced crusher design. Bulletin 126 illustrates its superiority in detail.

A comparison of the past with the present illustrates the great progress made in finding new ways to do a job better . . . make work easier. For 50 years, Traylor has taken a leading part in developing more efficient machinery for crushing and grinding ore. By working closely with the mining industry, we have "Traylorized" our equipment to keep ahead of its most exacting demands. The key to designing outstanding machinery is experience. Traylor has experience . . . half a century of it.



TRAYLOR ENGINEERING & MANUFACTURING CO.
 1463 MILL ST., ALLENTOWN, PA.
 SALES OFFICES: New York, Chicago, San Francisco
 Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.



a **Traylor** leads to greater profits



**TAILINGS yesterday
because of the price of metal.**

**New Denver "Sub-A"
Super Rougher Flotation Machine
in roughing circuits aids in
getting values which are now
profitable with higher prices!**

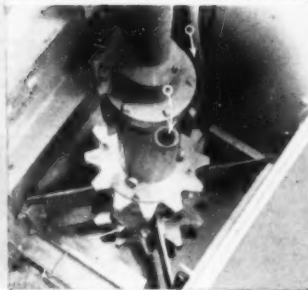
**The Denver "Sub-A"
Super Rougher
Flotation Machine**

features a low pulp level, adjustable froth depth and double overflow so froth may be quickly discharged before bubbles drop their load. Photo shows a 2-cell, No. 18 Sp. (32x32) Denver "Sub-A" Super Rougher Flotation Machine, filled with water. Depth of water is 18". Intense agitation and aeration raises froth to 26", a deep froth of 8"



Controlled feed

to the agitation chambers add to the flexibility of the unit. Feed to agitating chamber is regulated by rubber bushing to meet ideal flotation conditions. An adjustable sand relief opening is placed low in the cell. Pulp level is adjusted by a handwheel weir gate at the end of every two cells. This is a double impeller mechanism.



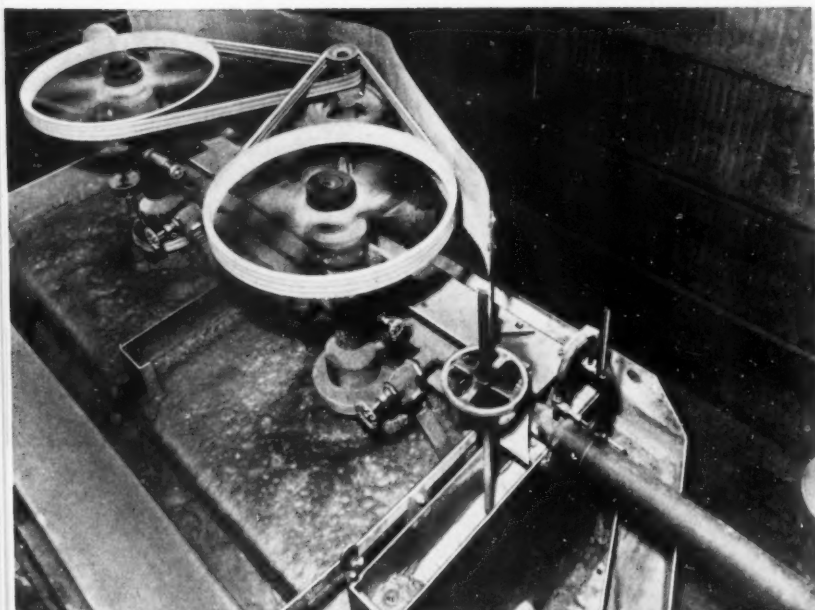
DENVER EQUIPMENT
1402 17th Street, Denver 17, Colorado
Our 25th year of Flotation

[World Mining Section—14]

MINING WORLD

may be **PROFITS** today!

Here's the *New* Denver "Sub-A" Super Rougher Flotation Machine to recover more values . . .



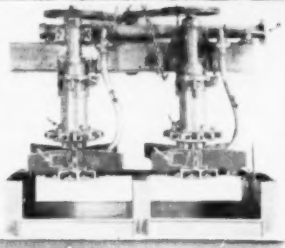
Here is a flexible Flotation Machine that gives intense aeration and short-distance froth overflow, so important on extremely low-grade ores and coarse-grind feed. As a scavenger machine at the tail end of a circuit, the unit increases your mill efficiency by lowering tailings losses.

Featuring a low pulp level, this NEW Denver "Sub-A" Super Rougher Flotation Machine offers controlled aeration, intense agitation, and regulated feed. These are the flexible tools your flotation engineer needs to get results that pay greater profits.

The world's leader in flotation engineering, Denver Equipment Company adds the Denver "Sub-A" Super Rougher Flotation Machine to its long list of continuous flotation machine improvements. You can buy all of your ore dressing equipment from DECO, you get everything from testing to dryer from one company, one responsibility, without a premium.

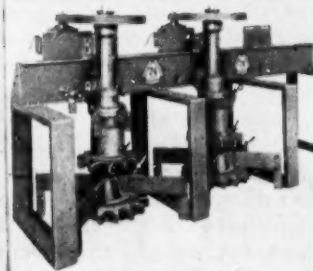
Find out how you can get more PROFIT out of your ore with a Denver "Sub-A" Super Rougher Flotation Machine. Phone, write or wire today!

For simplified repair, the entire assembly may be removed easily. All wearing parts are standard and interchangeable with other Denver "Sub-A" machines. Single or double impeller mechanisms provide maximum aeration and are furnished to meet your specific recovery and frothing objectives.



Conversion units

are built for most makes of flotation tanks. You get the same mechanisms that are standard on the new Denver "Sub-A" Scavenger Machine. This gives you the advantages of standard, reliable DECO service and efficiency. More Denver "Sub-A" Flotation Machines are used for roughing and cleaning than all other makes combined. Find out how you can profit by converting to Denver "Sub-A."



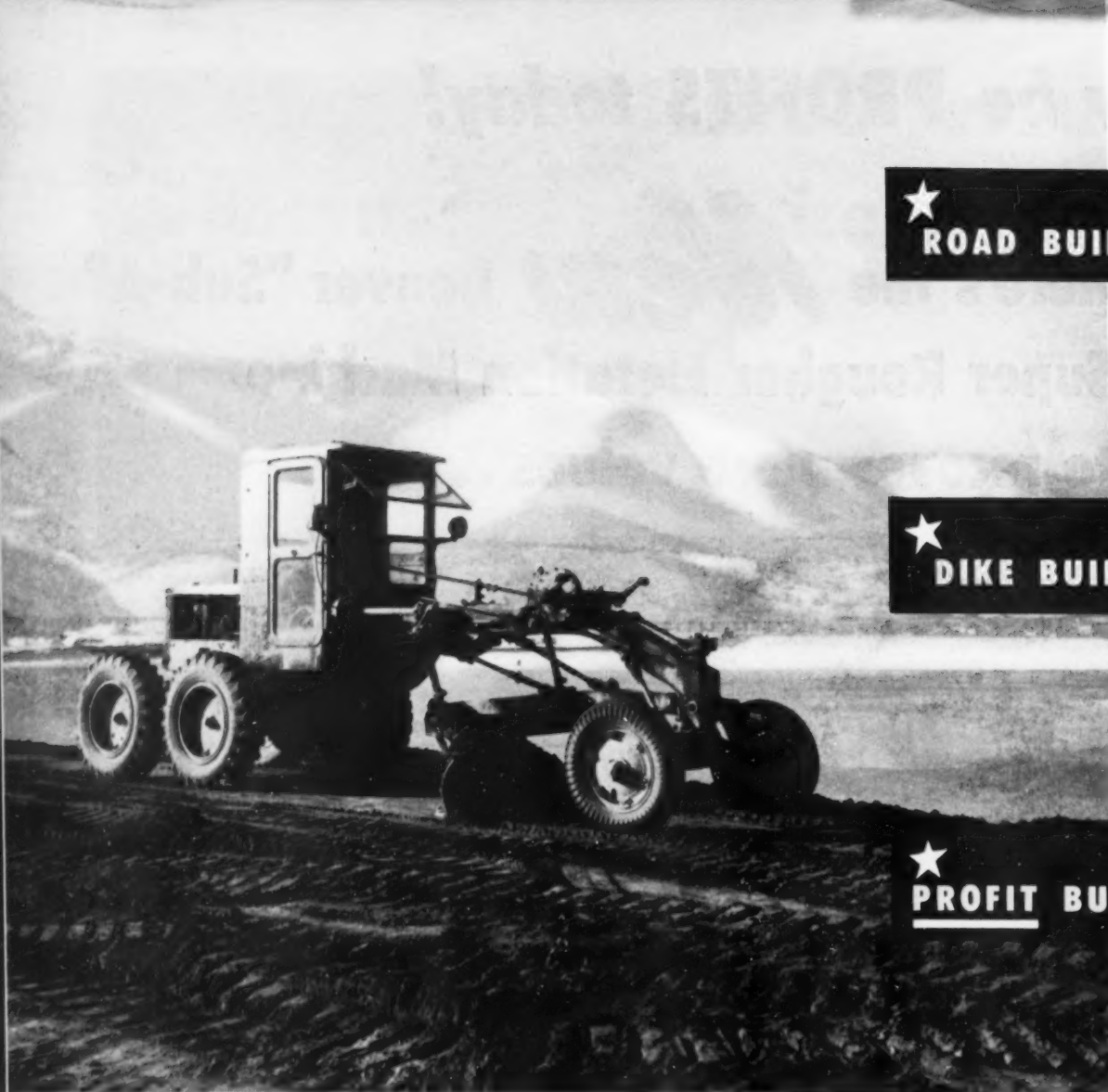
C O M P A N Y

Engineering

OCTOBER, 1952

[World Mining Section—15]

15



★
ROAD BUILDER

★
DIKE BUILDER

★
PROFIT BUILDER

FIFTY miles of private road serve Bunker & Sullivan Mining Company's lead mill at Kellogg, Idaho. To extend these roads whenever necessary and to keep them all in shape to handle 20-ton trucks, Transportation Supt. H. O. Papineer relies on this "Caterpillar" No. 212 Motor Grader and a D2 Tractor. These big yellow machines also build dikes for the mill's sluice pond. When chores like these are carried out quickly and efficiently, the results show

up in any mining company's profit column. That's why Supt. Papineer reports, "We really prefer 'Caterpillar' equipment."

The No. 212 Motor Grader is all "Caterpillar" built, with engine, controls, transmission, frame and circle assembly *all* built entirely in one factory, all serviced entirely by one organization. Its weight is balanced precisely with its horsepower and working speed. Its mechanical power controls are al-

ways dependable and accurate, with new precision-cut curved teeth giving longer life and easier operation. Its tandem drive allows climbing action no other type can give, backs across ditches smoothly, and picks up maximum traction with its four drive wheels directly under the weight of the powerful engine.

More than 99% of all "Caterpillar" Motor Graders built since 1931 are still on the job. Rugged construction and genuine "Caterpillar" parts made that record possible. The same dependable performance can be yours, too. See your "Caterpillar" Dealer.

CATERPILLAR, San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

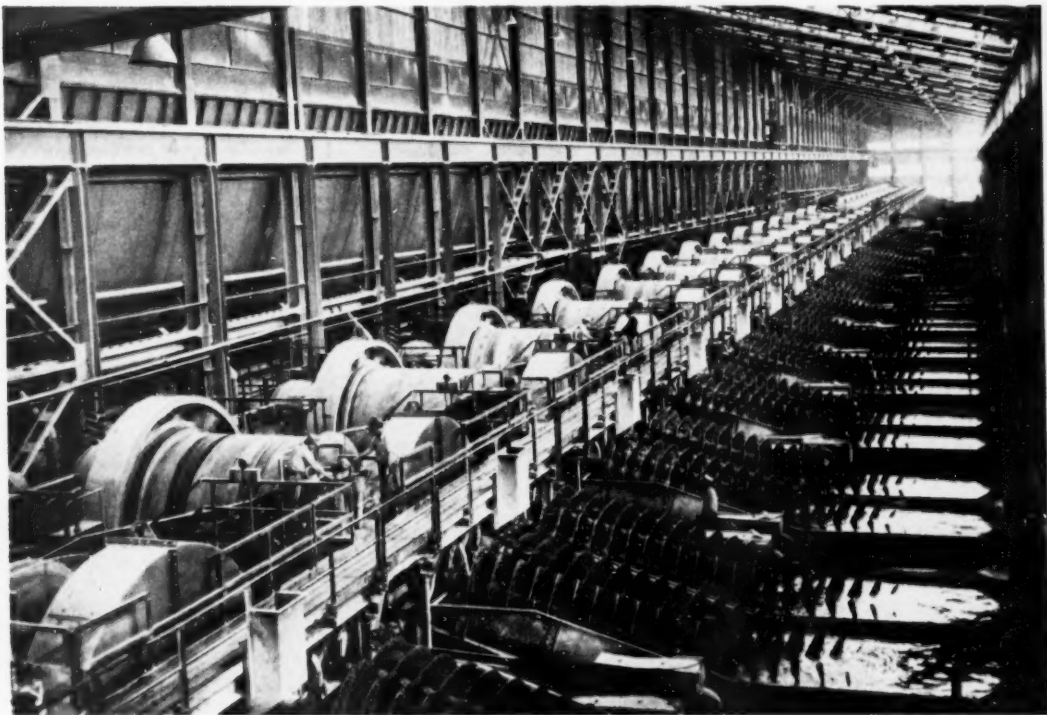
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**DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**

A Cost-cutting team

• AKINS CLASSIFIERS • MARCY MILLS

The many successful mining companies thruout the world who continue to place repeat orders for Marcy Ball and Rod Mills and Akins Classifiers prove the low-cost-per-ton performance of these machines.



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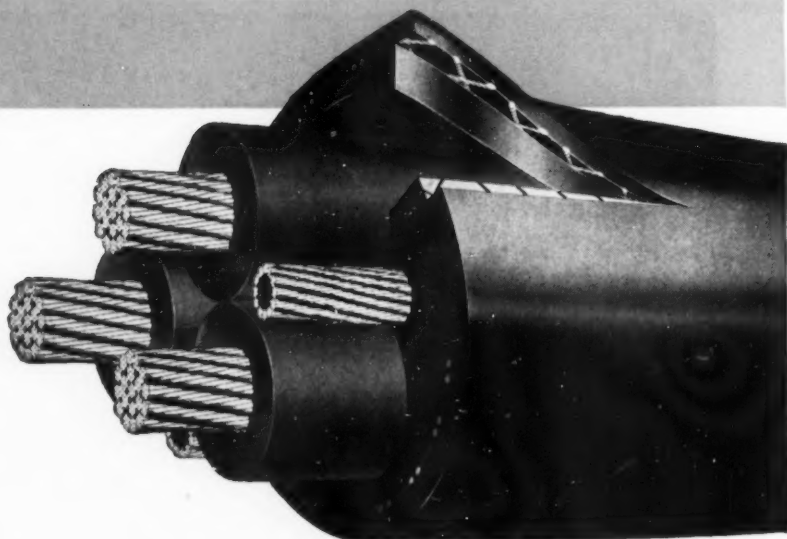
Let our engineers show you the proof . . . actual operating data for all kinds of grinding and classification problems.

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A Subsidiary of **The Mine & Smelter** Denver 17, Colorado
Supply Co. Offices in Salt Lake City, El Paso and 1775 Broadway, N. Y. C.

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much more compression resistance
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This means far more dependable and efficient grounding. When the cable twists in service the grounding wires are protected. Every wire in every strand is firmly supported and cushioned. There'll be fewer failures, fewer splices, less production loss, less expense.

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WIRE AND CABLE

MINING WORLD

and the export edition
WORLD MINING

A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

OCTOBER, 1952

VOL. 14 No. 11

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COVER CIRCLE: Drilling a drift round at Miami Copper Company. The circular steel sets are kept as close to the face as possible and placed with the aid of two H-beams slung beneath the upper arc of the end sets.

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DRIFTS AND CROSSCUTS

Your Vote Is Important

The domestic mining industry has a high and vital stake in the forthcoming national election.

Industry spokesmen have reported that for the first time the major parties have both adopted planks in their Party Platforms favorable to domestic mining.

This is a notable achievement of great importance to the mining industry when one objectively considers the national voting significance of the entire industry in comparison to labor, farmers, big city blocs, and other groups.

The Republicans' mining planks are as follows:

"We deplore the policies of the present administration which allow special premiums to foreign producers of minerals available in the United States. We favor reasonable depletion allowances, defense procurement policies, synthetic fuels research, and public land policies including good faith administration of our mining laws, which will encourage exploration and development of our mineral resources consistent with our growing industrial and defense needs.

"We favor stockpiling of strategic and critical raw materials and special premium incentives for their domestic exploration and development."

The plank for gold and monetary policy advocated restoration of "a domestic economy and to use our influence for a world economy, of such stability as will permit the realization of our aim of a dollar on a fully convertible gold basis."

The Democratic party adopted the following plank:

"... We pledge the adoption of policies which will further encourage the exploration and development of additional reserves of our mineral resources ..."

Planks do not make laws, and experience has proven that a Congress friendly to mining can have legislation vetoed by the President.

With the greatest emphasis on the Presidential candidates, there has been, quite naturally, only a limited amount of interest in certain state contests where strong supporters of domestic mining are seeking office.

It is, therefore, of great importance that Senators and Congressmen be elected who have proven their right to represent the mining industry. There is no substitute for seniority and experience in Congress.

Voting is the highest right of the American citizen. Be sure to vote—and when you vote—consider what each candidate has done, or can and will do, for the domestic mining industry.

Your vote can help every miner.

G. O. A., Jr.

COMING CONVENTIONS

October 20 through 24, 1952. 40th NATIONAL SAFETY CONGRESS AND EXPOSITION, Conrad Hilton Hotel, Chicago, Illinois.

October 20 through 25, 1952. Mining Congress of SOCIETE FRANCAISE DE METALLURGIE, Paris, France.

November 6 to 8, 1952. FIRST ANNUAL SOUTHWEST MINERAL CONFERENCE, sponsored by the New Mexico Mining Association and the Southwest International Mining Association. Alvarado Hotel, Albuquerque, New Mexico.

December 2, 1952. Annual meeting AMERICAN MINING CONGRESS, University Club, New York, New York.

December 5 and 6, 1952. NORTHWEST MINING ASSOCIATION, annual convention, Davenport Hotel, Spokane, Washington.

February 12, 13 and 14, 1953. Mining Conclave and Convention, COLORADO MINING ASSOCIATION, Shirley Savoy Hotel, Denver, Colorado.

EAGLE-PICHER uses fleet of Allis-Chalmers tractor shovels to

Speed Underground

Eagle-Picher's constant search for new and better ways of mechanizing mining operations has led to the use of 20 Allis-Chalmers tractor shovels to speed underground loading at Tri-State Mines. In addition to this operation, Eagle-Picher has assigned these versatile TRACTO-SHOVELS to a wide variety of other jobs to increase production and reduce costs.

● here's what they do underground...

Loading ore directly into 15-ton hauling units after the ore face has been drilled and blasted.

Excavating—driving drifts through barren ground to reach new ore bodies.

Building and Maintaining all underground haul roads.

● and on the surface...

Loading and Hauling tailings, sand, gravel, silicon, lead and zinc ore, general supplies.

Digging drainage terraces, culverts, pond dams, railroad fills.

Setting and Placing drain tile, pipe, machinery.

Building and Maintaining parking lot and haul roads, cleaning up around hopper.

● new era of tractor usefulness

Today's mining needs require tractors that give high output and yet handle many different types of jobs. TRACTO-SHOVELS measure up to these new standards with performance advantages like these: big-capacity loading . . . excellent maneuverability and compact design for working in confined and low ceiling areas . . . standard electric starting of 2-cycle diesel engines meets necessary safety regulations for underground operation.

Your nearby Allis-Chalmers dealer can give you detailed information on all TRACTO-SHOVEL advantages. See him or phone him soon.

1-YD. HD-5G

2-YD. HD-9G

3-YD. HD-15G

4-YD. HD-20G

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A

Loading



UNDERGROUND

The 17 HD-5G's and 3 HD-9G's load ore into hauling units . . . excavate to reach new ore bodies . . . maintain all underground haul roads.

▲ SURFACE

HD-5G's haul and load lead and zinc ore, sand and gravel, other bulk material . . . dig drainage terraces, culverts, pond dams, railroad fills . . . build and maintain haul roads and clean up around hopper.

Bucyrus-Erie Leadership in Walking Draglines...



Exclusive ROLLING-CAM WALKING ACTION

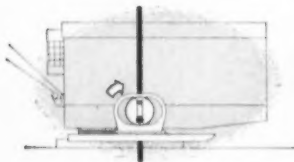
One big reason why Bucyrus-Erie draglines are such smooth, steady workers is that they are smooth, steady *walkers*. They can step out in any direction . . . on loose sands, over swampy ground, along muddy river bottoms and the edges of banks . . . through weather that would stop

crawler mounted machines.

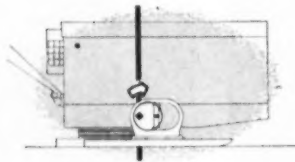
There's no jerking . . . no shocks to machinery, either, because the weight of the dragline is cushioned with almost unbelievable ease by Bucyrus-Erie's exclusive rolling-cam walking action.

100L52

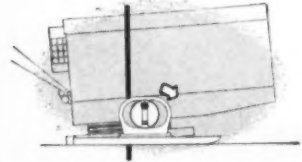
No other walking system is so smooth, so strong or so simple in design



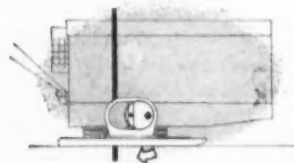
1. Working position. Shoes up—cams in center—guide roller pin at top.



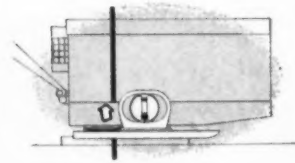
2. Cams rotate—advance shoes and place them on ground.



3. Leading edge of base lifts and skids along as cam rolls to half-way point in rotation.



4. Base is lowered as cams continue to roll.



5. Rotation completed—return to original position.

**BUCYRUS
ERIE**

South Milwaukee
Wisconsin

MINING WORLD



CAPITOL CONCENTRATES

CONGRESS TO BE BY-PASSED BY TRUMAN'S NEW MINERAL BOARD

The much-discussed Paley report proposes a vast number of changes in basic policies which have governed the exploration and development of the country's mineral resources. As many of the changes suggested are fundamental, it would seem that the Congress should make such alterations rather than government departments and agencies. Congress should at least be given the opportunity to discuss them.

However, the plan seems to be to ignore Congress and go at the job through the agencies, and go at it so fast that even those most directly concerned will have but little opportunity to analyze the million-word report and let their views be known. In other words, it looks as though the recommendations are to be crammed down the mining industry's throats whether those directly concerned approve of them or not. A special task force has been created within the National Security Resources Board, under the direction of William H. Stead, to do the job.

The group, made up of representatives of 25 major departments and agencies of the government, will review the recommendations made by the President's Materials Policy Commission (Paley Commission) and decide on ways of putting them into effect. Included in the task force are representatives of the Department of Interior, Atomic Energy Commission, Federal Power Commission, National Science Foundation, Defense Production Administration, Defense Materials Procurement Agency, and General Services Administration.

The special task force was created at the direction of President Truman and was ordered to make a detailed study of the Paley Commission's report and give him its own suggestions within two months. Meanwhile, the departments and agencies concerned with raw materials are to make recommendations to the President.

Mining men believe that the industries concerned should be given some opportunity to be heard. Where the recommendations involve changes in the basic structure on which our mineral industries have been built, Congress and congressional committees should make the decision, they say, rather than leave it to the group now in Washington whose philosophies reportedly often border on the red, or are decidedly pink.

● Status of Mineral Programs Analyzed

Before long the mining industry may expect to hear the details of a new copper program which is being talked over by DPA and DMPA. The present program, which is running out, has worked better than most of the others. It has kept a number of mines open which would have shut down and has made possible potential production four or five years from now. However, it has not stimulated the opening of the smaller mines.

There is no lead program outside of the purchase of a few thousand tons as cheaply as possible.

There is no zinc program and a large part of the industry is on the verge of shutting down. These shut-downs will affect the lead situation also.

The antimony business is shot, as is shown by the shut-down of our only major producer, the Bradley

Mining Company's Yellow Pine Mine at Stibnite, Idaho.

An asbestos program is in the making in DMPA.

The tungsten program as far as the bulk of potential domestic operators is concerned is a flop. The government knows why, but feels it can get its requirements from a handful of large operators and from imports. Recently DPA announced an increase in its requirement figures for tungsten amounting to 25,000,000 pounds. Accelerated amortization and "other government aids" will be given to operators who increase production.

What the domestic tungsten producers really need is a better price, or more refining capacity strategically located which will operate at lower costs, or both. Unless such action is taken the additional requirement will be supplied mainly from abroad.

The domestic manganese program has produced only a relatively few thousand tons of our requirements. A small-lot program at a price which seems high when compared with the market was recently announced, but the mechanics of the program are complicated and it is doubtful if it will be effective in creating important additional production.

The chrome program has resulted in the production of a few thousand tons in the Northwest under the stimulation of higher prices. It will be a year or two before the Montana chrome deposits can be put into effective production of a marketable product. Nearly two years were lost in government paper-work before this project was approved although all the data were available from the last war, as well as a commercial process to utilize the chrome concentrates.

The price of ferro-manganese has been increased by OPS. Ferro-chrome may be expected to follow.

The fluorspar program has increased the supply materially.

The columbite-tantalite program will help production from abroad, but the agencies do not seem to be especially interested in exploring for domestic sources although there is a 90 percent government-participation program on paper.

The mica program, as far as government purchases are concerned, will not be of much help to domestic producers of strategic mica due to the famous "ruby" trade specifications. The exploration program, however, is quite active and a good many applications have been approved, especially in the South.

It is still hard to live long enough to get an application approved by DMPA or RFC. DMEA does much better.

In the meantime, the foreign expansion program proceeds merrily on its way with a minimum of personnel, little friction, many contracts written quickly and efficiently, and a vast outpouring of funds.

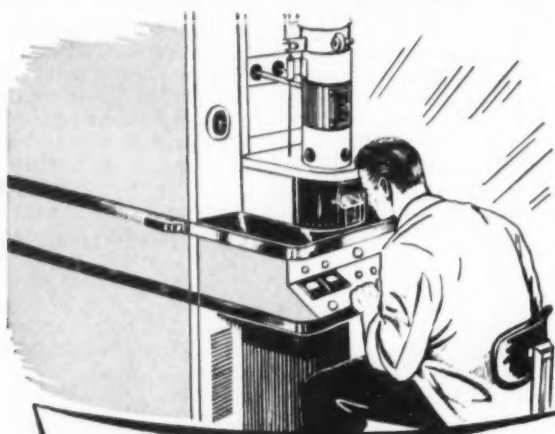
● Disagrees With Paley Report Conclusions

A press release relating to the contract with San Manuel Copper Corporation, sent out by the Defense Materials Procurement Agency, quoted a statement from Jess Larson which is in direct opposition to the conclusions of the Paley Commission concerning the future of this country in finding new ore deposits.

"The signing of the agreement with the San Manuel Corporation emphasizes two things about our minerals and metals situation," Larson said. "First, it produces

TESTING SERVICE

for west coast mills having new or unusual metallurgical problems



By arrangement through Cyanamid Field Engineers, Western Mills have access to the facilities of the Cyanamid Mineral Dressing Laboratory with its chemical, physical and microscopical divisions for testing any metallic or non-metallic ore and determining the most efficient treatment method.

Whether you can best use cyanidation, flotation, Heavy-Media Separation, Dutch State Mines Cyclone Separator or any combination of these with other methods, Cyanamid stands ready with the reagents, processes and technical know-how to help you get highest recovery at lowest cost.



Orders for Cyanide, Flotation Reagents and other Metallurgical Chemicals may be placed with American Cyanamid Company, Azusa, California; El Paso, Texas; or c/o Weicker Transfer & Storage Co., Denver, Colorado.

AMERICAN

Cyanamid
COMPANY

MINERAL DRESSING DIVISION
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

tangible proof that the United States is a long way from exhausting its underground reserves of needed materials. Second, it brings us face to face with the cold fact that large mining operations do not spring up overnight . . . (and that) there is no escaping the fact that we have to think in terms of years—not months or weeks—on this kind of an operation.”

The Paley report attempts to drive home the idea that The United States must look to foreign countries for future metal and mineral resources and that we should send our money abroad for their exploration and development. Citizens and taxpayers believe they should at least be given equal opportunities with those abroad. Many remember how the sea lanes were closed by submarines when we badly needed metals and minerals during World War II. A map of submarine sinkings, published in *Mining World* in March 1951, indicated a tremendous amount of copper lying on the bottom of the ocean in the sea lanes between Chile and the United States.

● Budget Looks Into Minerals Mess

Reports from Washington say that the Budget Bureau is now studying the desirability of consolidating the functions of the emergency defense agencies which deal with minerals and metals. It is a sad situation when things are so bad that the Budget Bureau, which is responsible for some of the mess, gets busy on clean-up plans.

Commenting to Budget Director F. J. Lawton, Congressman Walter Baring of Nevada stated that he “had long maintained that there is a scandalous amount of ‘red tape,’ inertia and buck-passing in these agencies.” Baring called Lawton’s attention to legislation which he sponsored in Congress to alleviate conditions. These included H. R. 3654, to establish an office of Federal Minerals Coordinator; H. R. 5719, to finance the exploration, development, production and production-expansion of critical minerals and metals; H. R. 5651, to set up a Mine Incentives Payments Division; and H. R. 5964, to establish a Department of Mineral Resources.

Baring confessed to Lawton that, despite his persistent efforts to get action, “no one has obtained less constructive results from the agencies in attempting to correct these organizational matters through legislation. The agency reports on the bills invariably are adverse and frequently point out that there is sufficient authority in existing legislation to accomplish the desired result did the Administration desire to act.”

The abuses, delays and lack of action and results are well known to all and the question is, why has not some one acted?

● Foreign Copper Is Decontrolled

The government has ordered decontrol of all sales of imported copper and copper refined from foreign ores, as well as imported copper raw materials and scrap. In addition, the brass and wire mills were given the go-ahead signal to increase their prices to reflect the higher price they are paying for imported copper. These increases are based on allocations of 60 percent domestic copper at the ceiling of 24.5 cents and 40 percent foreign metal figured at 36.5 cents a pound.

Copper people express doubt that United States consumers will take all of the 53,000 tons of foreign metal they are entitled to buy for July. Therefore, they are wondering if the government will buy the excess for the military stockpile.

There are rumors that the government is trying to work out a civilian stockpile of copper—particularly as it applies to Chilean output.



INTERNATIONAL PANORAMA



TORONTO—Silver-Miller Mines Limited has contracted to sell 5,000,000 pounds of cobalt to the United States' Emergency Procurement Agency. Initial production will come from the new La Rose mill. Minimum deliveries are to be 1,000,000 pounds per year starting in 1953.

SPOKANE—The Spokane-Idaho Mining Company and the DMEA are jointly undertaking a \$188,000 lead-zinc exploration project at the Douglas mine in Idaho's Coeur d'Alene mining district. Work will consist of 200 feet of shaft sinking and 2,850 feet of drifting.

RIVERTON, MINNESOTA—Chemicals Corporation will build a new chemical leaching plant here to recover 60 percent manganese concentrate from Cuyana Range manganese iron ores. DMPA will advance up to \$1,500,000 for the plant and buy 2,625,000 long ton units of manganese.

LISBON—The Portuguese government with MSA aid has started a 2½-year aerial mapping and ground geological survey of Angola and Mozambique. The project will cost about \$2,000,000 with the United States' share about 90 percent.

VIENNA—The Mutual Security Administration has approved \$500,000 for additional equipment to expand output of iron ore at the Erzberg and Radmer mines of the Austrian Alpine Montan Company. The company had previously received \$2,611,000 in Marshall Plan aid from the United States.

STOCKHOLM—Export of iron ore during the first half of 1952 was 7,139,000 tons. This is a big increase over the similar 1951 shipments of 6,041,000 tons.

LONDON—The London Metal Exchange is to resume trading in lead on October 1, 1952.

NIAGARA FALLS, NEW YORK—The Carborundum Metals Company, Incorporated is building a \$2,433,000 plant here to produce zirconium and hafnium metal for the U. S. Atomic Energy Commission.

CLEVELAND—August shipments of iron ore by Great Lakes ore carriers were the largest for any one month in history and totalled 14,367,627 gross tons. A weekly record was also set in the month when 3,336,033 gross tons were mined and shipped.

VANCOUVER—The first shipload of British Columbian iron ore destined for Bethlehem Steel Corporation's Sparrows Point, Maryland, steel plant has been shipped by Argonaut Company, Ltd. Two shiploads will be mined per month under the Bethlehem contract.

MOSCOW—Large increases in mineral output are scheduled for the Soviet Union's fifth five-year plan. Steel production is scheduled for a 62 percent increase to 44,700,000 annual metric tons. Copper output is to be increased 90 percent, zinc 150 percent, lead 170 percent, and nickel 53 percent.

BULAWAYO—The Johns-Manville Corporation's subsidiary, Rhodesian Asbestos Limited, will build a small central asbestos processing mill and develop mines in the Victoria district east of here.

LONGVIEW, WASHINGTON—The Reynolds Aluminum Company has increased aluminum capacity from 40,000,000 to 100,000,000 annual pounds at its plant here.

WHITEHORSE—The American Metal Company, Ltd.'s subsidiary, Ampco Exploration, Incorporated, is providing Mount Keno Mines Limited up to \$3,000,000 for development of Mount Keno's silver-lead mine.

SUPERIOR, ARIZONA—The San Manuel Copper Corporation has signed a copper floor price contract with the Defense Materials Procurement Agency for production and sale of 365,000 short tons of electrolytically refined copper at 24 cents per pound. A similar contract calls for 16,060 short tons of contained molybdenum, in concentrates, at 60 cents per pound.

COLUMBIA FALLS, MONTANA—Anaconda Copper Mining Company is going to build a \$45,000,000 aluminum plant here to process alumina purchased from the Corpus Christi, Texas, plant of Reynolds Metals Company.

DULUTH—The Inland Steel Company's ore carrier Wilfred Sykes established an all-time Great Lakes iron ore shipping record when it carried 21,013 tons of ore to Indiana Harbor, Indiana.

CLEVELAND—An all-time record was established for a seven-day period when 3,280,094 gross tons of iron ore were transported by Great Lakes ore carriers from Upper Lake ports to steel plants.

ROUND MOUNTAIN, NEVADA—Increased costs of operating supplies and labor have forced the Round Mountain Gold Dredging Corporation to suspend operation of its 17,000 ton per day open-pit gold placer mine and dredge-like milling plant here.

BAGUIO—Mill capacity at the Itogen Mining Company is to be increased to 800 tons of gold ore per day from the present 600 tons.

JOHANNESBURG—The United States' Export-Import Bank has loaned an additional \$19,000,000 to expand byproduct uranium recovery in the Union of South Africa. New loan funds will enable the Electricity Supply Commission of South Africa to expand steam-electric power supplies.

PARIS—The U. S. Steel Company and Compagnie Minière D'Congo Français and other French companies are establishing an exploration company to prospect manganese deposits at Franceville, Gabon, French Equatorial Africa.

TRONDHEIM—Skaland Gravitverk is increasing annual production of graphite from 3,500 to 8,000 tons from its mines at Senja.

FRANKLIN, NEW HAMPSHIRE—The DMPA has opened a high-grade mica purchasing depot here. Prices range up to \$70.00 per pound for No. 3 and larger "good stained and better" processed black and flm mica.

Minerals Advisory Council Is Officially Dissolved

Formal dissolution of the National Minerals Advisory Council was effected on September 12, 1952 upon orders of Oscar Chapman, United States Secretary of the Interior. In its several years of existence the Council met periodically to advise the Secretary. The United States Attorney General had advised Chapman that the Council failed to meet the minimum requirements laid down by the Justice Department and the Comptroller General ruled that no expenditures of appropriated funds could be made for council activities.

Churchill Plan Said To Back Gold Price Increase

According to London reports, Prime Minister Churchill and British Chancellor of the Exchequer Butler are working on a new plan to solve Britain and the Commonwealth's economic problems.

A higher price for gold is said to be one of the main planks of the program. This plan reportedly aims at restoring the convertibility of the Pound Sterling to United States Dollars at the present fixed rate of \$2.80, but the gold points between which the pound will be allowed to fluctuate will be widened from their present permissible fluctuation between \$2.68 and \$2.72.

Convertibility of the pound should encourage investments in mine exploration and development once the opportunity is available to transfer capital and profits. The Churchill Plan is expected to be presented to the Commonwealth Prime Ministers when they meet in London in November.

New Soviet Five-Year Plan Calls for Metal Increases

Soviet Russia's fifth Five-Year Plan, to be completed by 1956, provides for large increases in metal production, according to dispatches from Moscow. Goals of the new plan are given in percentages above the 1946-1950 program.

By 1956, steel production is to be increased 62 percent above the indicated output of 27,600,000 metric tons in 1950, to 44,700,000 tons. Pig iron is scheduled for a rise of 76 percent to about 34,060,000 tons, and rolled steel calls for an increase of 64 percent, to about 38,400,000 tons.

An increase of 176 percent over 1950 output is scheduled for aluminum production. (Figures for 1950 are estimated at about 200,000 tons.) Development of the Angara River in south central Siberia as a source of cheap hydroelectric power for aluminum manufacture will account for a large part of this increase.

Copper is reportedly scheduled to increase by 90 percent, zinc 150, lead 170, nickel 53, and tin 80 percent.



Miami Copper Company now uses 6½-foot diameter circular steel sets spanned with three-inch lagging to support slusher drifts in its revised block caving system. Though the easily-replaced lagging bells out and breaks by the weight developed, the set remains, by and large, unharmed.

MIAMI BLOCK CAVING DEVELOPMENTS

Integrated slushers and belt conveyors replace all-gravity branch transfer raises; steel sets hold openings in moving ground beneath caving blocks

In keeping with its distinguished record of contributions to mining technology, the Miami Copper Company has adapted two new developments to the block caving method used at its copper mine at Miami, Arizona. One of these developments is an integrated system of slusher and conveyor levels to replace the full-gravity system of raises that transferred ore from caving blocks to haulage levels. The other inno-

vation is the use of circular and conventional steel sets for the maintenance of level openings subject to the moving ground pressures developed beneath active blocks.

In the 40 years from 1911 to 1951 the company mined nearly 125,000,000 tons from the massive Miami deposit. The orebody, overlain by 250 to 500 feet of barren capping, averaged 500 to 600 feet in thickness and viewed in plan is a triangle

3,700 feet at the base and 2,500 feet in altitude with the apex to the south.

The average copper content of 0.8 percent occurs mainly as chalcocite, with some chalcopyrite, bornite, covelite, malachite, azurite, chrysocolla, cuprite, native copper and molybdenite. These mineralized zones are in the pre-Cambrian Pinal schist.

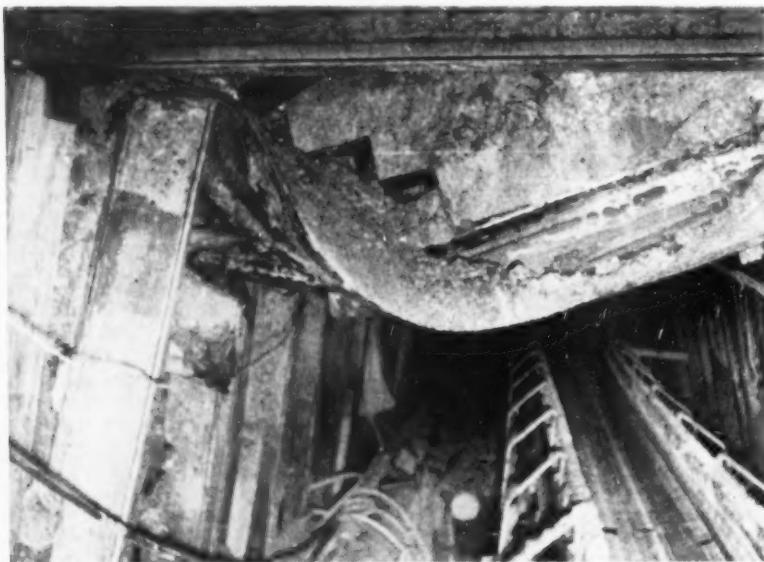
Block caving, in a system developed by the company and adapted to its own orebody, has proved to be the means of profitably mining the low-grade deposit. In the four-year period from 1925 to 1929, the company extracted 12,700,000 tons of ore for a total mining cost, both surface and underground, of about \$0.40 per ton.

For many years, caving blocks have been successfully extracted through a thick (125 feet) pillar between the undercut level and the main haulage level. This pillar thickness was necessary to provide the room required for a full-gravity system of branch transfer raises.

New System for Thin Pillar

Recently, however, a large part of the remaining ore reserves bot-tomed too close to the main haulage level to permit the use of a thick protecting pillar. For this reason, a new system of ore transfer was demanded if full extraction of the remaining ore blocks was to be realized. A new and lower haulage

The success of steel over timber is easily seen here where timber would have failed completely, preventing production, but where the eight-inch steel cap, though badly deformed, keeps the conveyor drift open and serviceable.



level, loading pockets, etc., could have supplied the answer, but the capital costs of this work would have been excessive in relation to the tonnage affected.

It was thought by the management that the problem could be best solved by a mechanical system of lateral transfer to haulageways on the main level. The distance between the existing haulage level and the bottom of the ore in the low blocks averaged 50 feet, as opposed to the 125-foot distance required by a full gravity transfer system.

In the gravity system, a 25-foot pillar separated the undercut and grizzly levels and provided space for control raises that fed the grizzly level. Under this level was a 100-foot pillar containing branch transfer raises that passed the ore to a single haulage drift driven parallel to the long axis of the block.

The new mechanical transfer system changed the design of the undercut and grizzly levels only slightly. Scrapers, however, were installed in what were formerly known as grizzly drifts to transfer the ore to timbered raises feeding the haulage level, 25 feet below the scraper level. Caving experience indicated the optimum width of a block to be 150 feet, a distance exceeding practicable scraping limits. Haulageways were therefore driven beneath the long contact between blocks rather than along the axis, thus providing two haulageways for each block. In this way, two scrapers with tailblocks at the center of the drift could be used in each

scraper drift, reducing the scraping distance to 75 feet.

Other advantages that this haulage-way placement could give were better protection for the haulage-way from the weight developed in an active block since they were between rather than directly beneath blocks, and more flexible haulage from a given block. Too, the scraper hoists, installed in "fringe" drifts on the scraper level parallel to and directly above the haulage drifts, could serve adjacent blocks after completion of the first without changing the hoist installation.

Weight Problem Intensified

This system, however, suffered from the rapid transfer of weight to the haulage level, a condition that had been effectively prevented by the thick pillars formerly used. This weight problem is always serious at Miami, is responsible for a sizable share of overall costs, and is a direct result of the same ore characteristic that has permitted the successful use of block caving—the deposit's structural incompetence. Miami ground cannot permanently support the weight developed by a column of broken ore. Consequently, drifts, crosscuts and haulageways must be maintained with artificial support. Since no known combination of wood, steel and concrete can be expected to offer permanent resistance to the pressures developed by millions of tons of broken material, an easily and quickly repaired system of support coupled with a haul system beneath the block that would

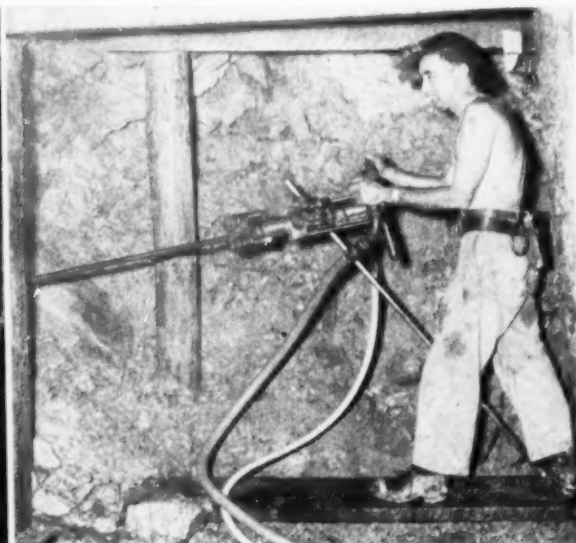


To recover the small but important amounts of copper that remain in worked out ground, Miami uses three-inch Carlon plastic pipe feeding a weak sulfuric acid solution to smaller plastic tubes placed in three-foot holes in the subsided surface.

allow repair without a cessation of production was the goal of a careful study by the company's staff.

The moving ground with which Miami must contend, though never sudden or instantaneous, is a constant problem in the active stoping areas. Thus, steady and relatively rapid extraction from each block being caved is absolutely necessary to prevent the loss of level openings. In other words, if production from a given block must be stopped for the repair of supports in grizzly or transfer drifts beneath it, this stoppage of production in the stope builds up pressures that cause more support failures, which require fur-

LEFT: In the new slusher-conveyor system developed at Miami Copper, ore is passed from the scraping level to the conveyors through a sloping grizzly that allows the fines to pass, padding the belt against the flow of coarser material. RIGHT: The Mexican set-up is here used by Pete Smith in developing the undercut level of a new block to be caved.





Miami's general superintendent J. W. Still (left), and engineer James Fletcher listen to a supervisor's report at the dispatch station on the main haulage level.

ther down time for repairs, which in turn allows pressures to increase, resulting in still more failures. The overall effect of such a cycle if sufficiently prolonged could easily be the complete loss of an ore block.

In the new system, both scraper and haulage drifts were affected and prevented the steady control and production that is all-important in block caving. The contact between ore and overburden must be maintained level during block production to prevent dilution and insure maximum extraction. This is accompanied by drawing from the control raises evenly throughout the caved area. The affect on track haulage was especially severe because the

movement of trains is next to impossible during repair periods. Scraper drifts, though closer to the caved material and therefore more subject to weight, were affected somewhat less due to the greater flexibility of scraping. To be successful, the system obviously required better means of ground support. Though weight as developed at Miami cannot be permanently supported, it must be prevented from destroying underground workings.

Circular Steel Sets

In 1950, drawing on the experience of the Cleveland-Cliffs Iron Company at Ishpeming, Michigan with steel in place of timber, the

company decided to install sufficient steel to test its feasibility. Circular steel sets were ordered from the Commercial Shearing & Stamping Company in the spring of 1950 and in about a year's time it was obvious that the steel was well worth while. At the present time some 4,000 feet of circular steel slusher drifts are in use; in those areas where weight is anticipated, steel sets are installed as standard.

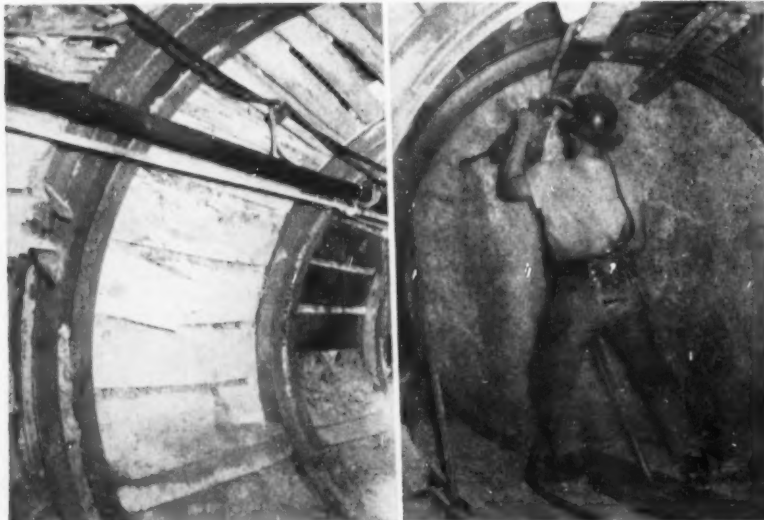
The circular sets, with an inside diameter of 6½ feet and assembled in place by bolting together three 120° flanged segments formed from four-inch, 13-pound H-beams, were used in the slusher drifts. When placing the sets, care was taken to insure even loading on the members. The circular design, when properly loaded, transfers pressures as in a natural arch so that, in effect, the weight works against itself rather than against only the support members. The conventional sets, posts and caps of six-inch H-beams and girts of four-inch angles, were used at the ends of the slusher drifts and in the fringe drifts where the scraper hoists were installed and in the conveyor drifts—wherever clearance greater than that afforded by 6½-foot circular sets was required.

Lagging Repairs Simply Made

The drifts in which steel sets were installed, even though considerable deformation occurred in places, remained open and serviceable long after timber sets would have failed completely. Though lagging replacement is common, the repairs are relatively simple and can be completed quickly enough to permit production on the same shift. The rock appears to shear around the set itself, putting the bulk of the weight on the more easily-replaced lagging, often leaving the set unharmed. When the lagging failed, the rock moving into the drift was removed and new lagging placed. The initial cost, about 50 percent greater than for timber, is offset because with reforming, half of the members are re-usable when replaced and all have scrap value after complete failure. Though better than timber, the conventional steel sets seem to deform and fail more rapidly than circular sets, even though later installations used larger (eight-inch) and heavier members.

The reason for the better results with the circular sets is two-fold. First, the structural section, a circle, is much stronger with less serious results to the serviceability of

LEFT: Side-by-side steel sets have been found superior to only one. When one set fails, only one span of lagging is affected, thereby greatly simplifying repairs. RIGHT: The "Mexican set-up" using a standard Ingersoll-Rand J-45 jackhammer supported by a standard steel with a pointed detachable bit is used at Miami for driving drifts. Sets are kept as close to the face as possible and placed with the aid of two H-beams slung beneath the upper arc of the end sets.



the drift when deformed. Second, each circular set presents only a four-inch face to the rock, and thus the weight it supports is transferred to it largely through the lagging. When this lagging is replaced the weight on the set is relieved. The larger cross-section of the conventional members placed weight on the member itself which replaced lagging cannot relieve. Also, the greater flange width allows more of the lagging to bear on the set and reduces effective span of the lagging.

Belts Feed Main Haulage

Even though the use of steel sets was considered successful, downtime in the haulageways, though reduced, was still a problem. A lateral transfer system that required less clearance than track haulage was sought to facilitate support repairs and thus prevent or at least minimize production breaks.

As a solution to this problem, drifts carrying two 200 to 250-foot long belt conveyors each, placed with abutting tail pulleys at the center of the drift and designed to service six or seven scraper drifts, were driven parallel to and 18 feet below the scraper and level fringe drifts.

As now used, the conveyors feed to haulageways on the main level, eight feet below the conveyor level. These track haulageways, for better protection, are driven parallel to the short side of an active block and outside of the area taking the greatest weight. The reduced clearance demanded by the belt conveyors not only allows greater set deformation before repairs are necessary, but permits repair and maintenance without stopping production. Conventional steel sets are now used in the conveyor drifts, though plans are underway to try larger (7½-foot diameter) circular sets in the conveyor drifts.

In the scraper-conveyor system, ore passes from the undercut level to the scraper level through control raises as it did in the original system. Scrapers then drag the ore from the control raises to the raises in the fringe drifts that feed the conveyor. Each scraper services six sets of control raises and, by selectively scraping from these, can closely control the draw from each and thereby maintain the desired draw for the stope as a whole.

Ore from the scraper level drops through raises (with 10-inch grizzly at top) to a sloping grizzly (4-inch spacing) mounted above the conveyor. Fine ore passes through the

grizzly and cushions the belt against damage by the coarse fraction, the flow of which is dampened by a baffle of swinging rail sections hanging above the grizzly. Two-ton bins with air-operated gates are set between the conveyor level and the main haulage level.

Maintaining Draw Control

When loading, the motorman brings in a 28-car string of four-ton empties, uncouples, and moves to an adjacent haulageway to pick up a string of loaded cars for transfer to the station. The string of empties, controlled by a double-drum car spotter installed near the conveyor hopper, is loaded by the conveyor operator from the hopper in about 18 minutes and is ready when the haulage motor returns. During this time the conveyor and scrapers work continually with the hopper, acting as a surge bin to handle the ore flow between cars. Both scrapers and conveyors are stopped when the string has been loaded to await the next string of empties. Such a system requires, above all, complete coordination of scraping, conveying and car spotting.

Integration of the operation and control of the draw is achieved by a combination of engineering planning and close supervision and communication. Scrapermen, conveyor operators and motormen are instructed before the shift starts in the tonnage that should be pulled from each control raise (and therefore from each scraper and conveyor drift).

Scraping, conveying and haulage is coordinated by a system of signal



This eight-inch steel cap, used above one of the grizzlies feeding a conveyor in the Miami Copper Company's mine, has been compressed to a third of its former web thickness by the nearly irresistible weight.

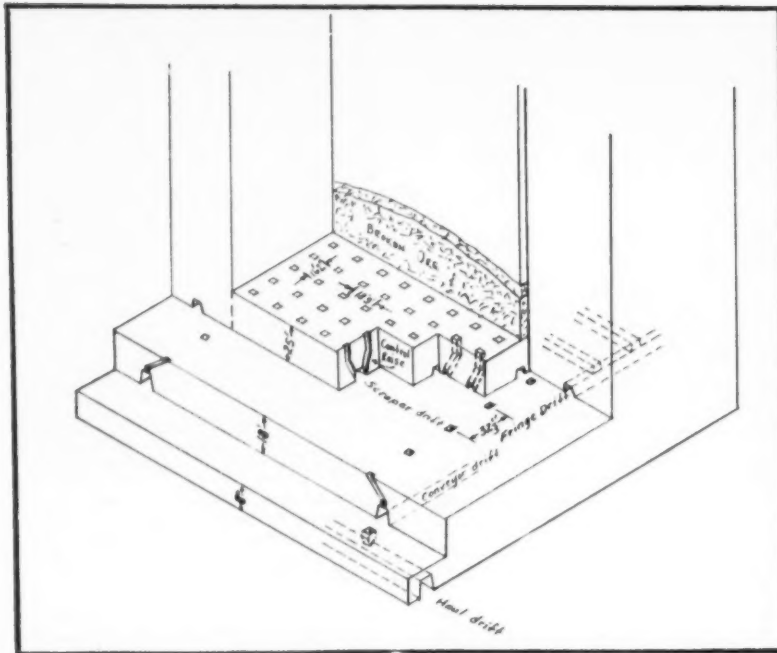
lights that are automatically lighted when the conveyor motor is started.

Side-By-Side Steel Sets

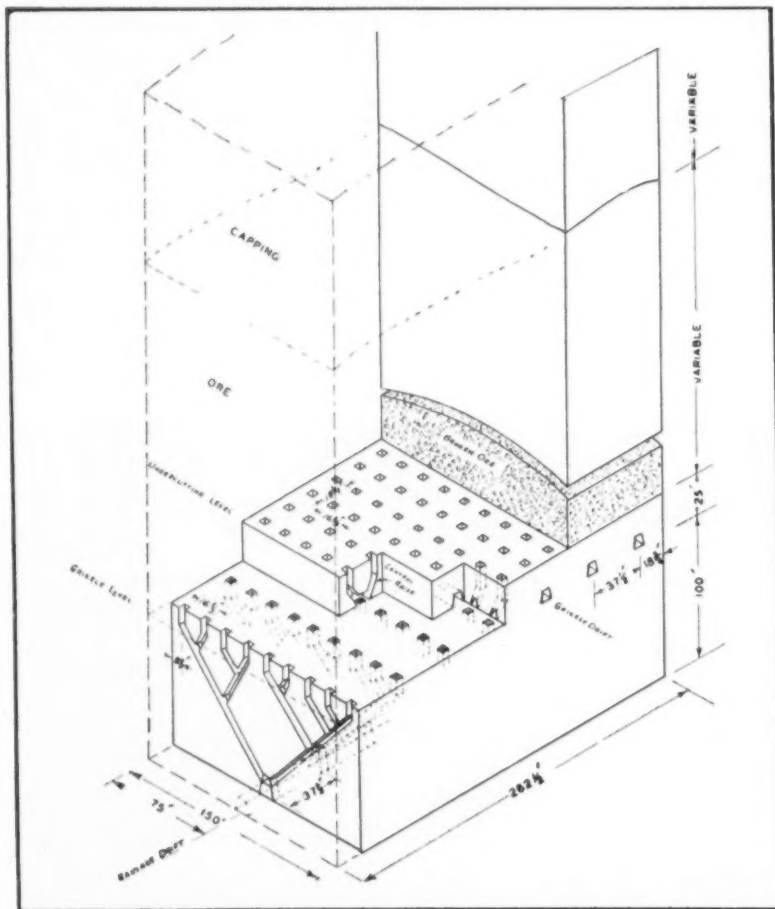
The scraper-conveyor system as finally evolved has been changed in only minor details. To prevent the failure of one circular set from destroying two spans of lagging, two sets are now placed side by side. When one set fails, only one span of lagging is affected, thereby greatly simplifying repairs. Originally the circular sets were separated by three-inch angles bolted to the sets. Minor deformations made the replacement of these angles difficult and they have now been replaced with 3 by 4 inch wood spreaders fitted between the flanges of the

J. D. Manues watches the level of ore in the hopper feeding to the main haulage level. When the bin is full the conveyor is stopped; scrapers on the level above are coordinated with the conveyor by an automatic system of signal lights.





The sketch above shows the new scraper-conveyor system of block caving that was developed at Miami Copper Company's famous mine to extract ore from areas that bottomed close to the haulage level. Below is a diagram of the full gravity transfer system the new method replaces. The thick pillar required by this method could not be used in many areas now being mined.



set members at 4:00, 8:00 and 12:00 o'clock. Lagging was first placed in the flanges as the spreaders now are, but more recent practice has shown that lagging placed outside the set can be more easily replaced. Small (3 to 4-inch) round timbers are used for top lagging in the circular sets and 2-inch flat lagging is used at the sides. Sets have been placed with the segment joints at 2:00, 6:00, and 10:00 o'clock as well as 4:00, 8:00, and 12:00 o'clock. The latter is easier to place and replace because the upper half of the set fails more often and includes only two of the segments in this placement.

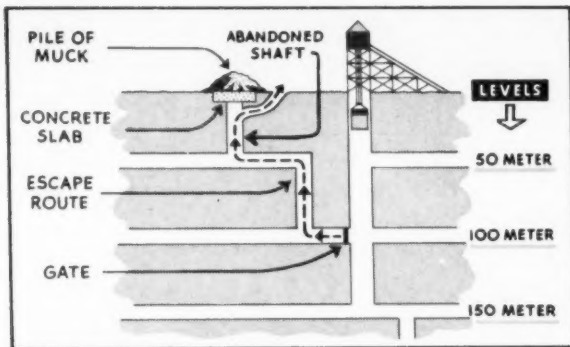
A typical slusher installation consists of a 42-inch Pacific Slushmaster scraper operated by a 25-hp. Joy or IR double-drum electric hoist; a conveyor installation uses a 30-inch by 210-foot Hewitt-Robbins belt driven by a 15-hp. U. S. induction motor through v-belts and a Dodge size 6 Torque-Arm speed reducer to permit smooth acceleration and deceleration on the frequent starts and stops required.

On the whole, due to the lesser weight maintenance factor, the new scraper-conveyor system offers better draw control and therefore better and more complete extraction than the old standard short raise system.

Ventilation and Leaching

Weight has also proved troublesome in the main inclined ventilation shaft even with heavy, gunnited timbering. Inside the old timber sets, new steel sets of four-inch H-beams spanned with three-inch lagging between the flanges have been placed to improve the ventilation efficiency by presenting a more even surface to the air column and to guard against set failures caused by weight.

Since about 1940 the company has operated a caved area leaching program. In the areas that have been mined out and caved, copper remains in considerable, though unmineable, quantities. To recover this, a weak solution of sulfuric acid was sprayed on the surface and collected at the main haulage level after percolating through the old workings. Though successful in recovering copper, the method lost water by evaporation and the spray of acid made work difficult. Miami now leaches by laying main surface lines of transite pipe that feed easily-handled two-inch Carlon plastic pipes. These in turn feed small plastic tubes placed in 3-foot holes driven at the surface of the area to be leached.



SUCCESSFUL ESCAPE: The key features were the gate, the abandoned shaft, the concrete slab and the unwitting assistance of the Russians.

THEY ESCAPED: Ivan Pluhar (right) and his partner enjoy a solid meal in Western Germany after escaping from the uranium mine.



RUSSIAN URANIUM MINE SECRETS REVEALED RECENTLY BY ESCAPED SLAVE-LABORERS

At midnight on September 17, 1951, Ivan Pluhar and six fellow slave-miners escaped from an underground uranium mine in Czechoslovakia. After eight nights of crawling through country woods, Pluhar and five of the six crossed the Iron Curtain into West Germany. The other man was caught or killed by guards at the border.

In 1949, Pluhar, then 22 years old, was sentenced to 15 years at hard labor for "crimes against the state." He was sent to work in the Joachimsthal uranium mines (near Chemnitz, in western Czechoslovakia, about 22 miles inside the Iron Curtain).

Looking for a way out, Pluhar and five other slave-miners decided to use an abandoned shaft (see drawing above) which had been blasted and filled with muck. This shaft was in an unworked portion of the mine, and was accessible only through a heavy locked gate (in drawing).

One of the men, a good geologist, stole the gate's key, made an impression using soap and bread crumbs, and used it for a pattern to duplicate the key.

After making the key, the next big problem became apparent as soon as they got inside the gate: The old shaft was filled with muck. If they drew muck out of the bottom, the pile on the surface would subside. They were good miners and could handle the incoming muck, but when the surface pile

started moving, the Russians would surely notice.

One of the men "tipped off" a guard, pretending to be carrying favor, and the latter had the shaft sealed with a 3½ inch thick concrete slab. This slab served three vital purposes. It kept the surface muck pile from disappearing into the shaft as the men drew out muck below, it provided a safe back, and it shielded them from the nearby guard when they holed through on the opposite side of the pile.

Pluhar (and all the slave-miners at Joachimsthal) worked under a "norm" (quota) system. They drifted on a round-in round-out basis. Each man's quota was 22 to 24 ore cars (about 1½ tons). After they had gotten out their quota, they entered the gate with their key, stationed their own guards at the gate and other key points. These guards didn't dare talk or shout, so they used lights to signal approaching danger.

The last big problem was informers. Pluhar and his group sabotaged the work of potential informers by making them fall below the "norm" so that the Russians transferred them to other working places or other mines.

After 3½ months of repair work and digging, the escape route was complete. The men didn't dare use powder because of the noise. The narrow escape raise was driven with hammers, moils and picks.

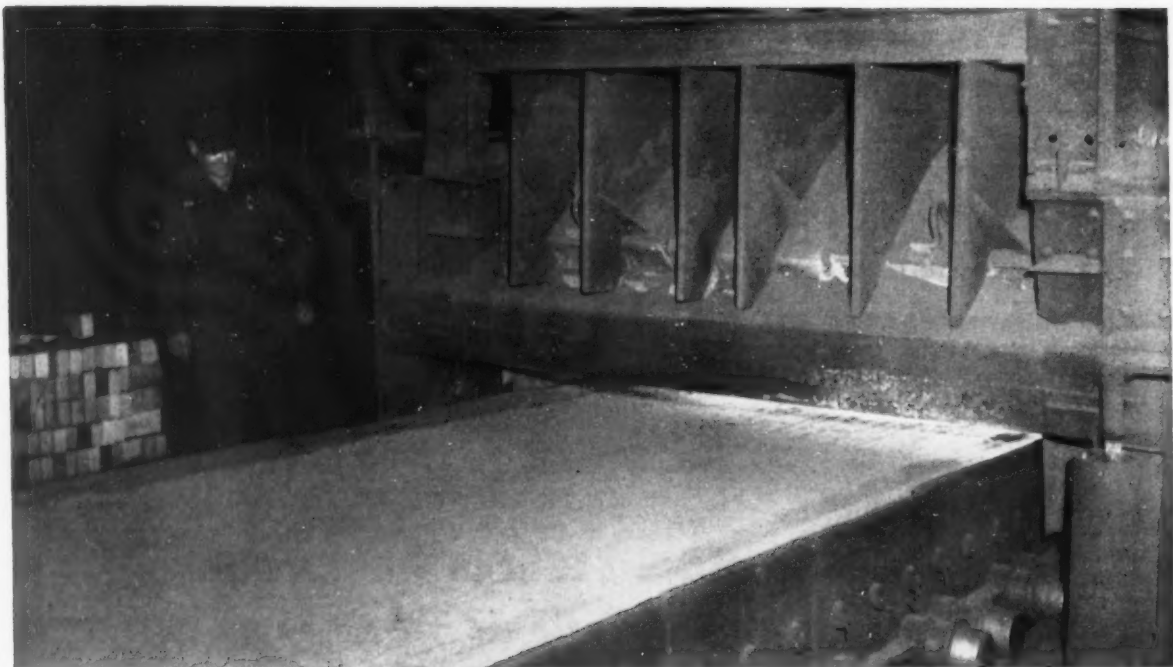
The Joachimsthal mines, as Pluhar

described them, are a group of about 20 mines worked by 30,000 slave laborers, a few Czech civilians, a host of guards (security police), with an all-Russian top management. All are new mines except four or five which were formerly worked for radium and silver. Ore varies in grade. At one of the mines, where ore was found at the grass-roots, the ore was so rich it drove Geiger counters off scale. There has been a little mechanization lately—two air-powered mucking machines are in use now.

All in all, with manpower quadrupled and quotas tripled, it looks like the Russians have increased effective labor (but not necessarily uranium output) by about 12 times since 1949.

The concentration and most surface work is done by paid Czech civilians. The ore is concentrated in two stages, and then shipped to Russia for final extraction of uranium. Pluhar reports that from the entire group of mines, the Russians every four days make a shipment of concentrate which consists of seven or eight trucks carrying from five to 10 tons each. Concentrate production from the entire group of mines, therefore, probably averages about 12 or 13 tons daily.

For the Russian technicians and managers, Pluhar has nothing but contempt; they're nothing but politicians. He says the real brains of the organization are the paid Czech technicians and engineers.



R. West, superintendent of the sinter plant, observes the sinter bed as it leaves the ignition furnace. Note the excellent uniformity of the bed surface.

IMPROVED SINTERING AT BENSON

Jones & Laughlin Ore Division develops a roll feeder to assure uniformity of bed with a resultant increase in output of a physically better sinter

Increased capacity and a better sintered product have resulted from the development of a better method for feeding magnetite concentrates onto the grate of the Dwight-Lloyd sintering machines at the Benson Mines of the New York Ore Division, Jones & Laughlin Steel Corporation at Star Lake, New York. The change was made following a study of sintering practice made early last year.

Benson Mines magnetite concentrates are minus-20-mesh with about 45 percent of the product finer than 100-mesh. Iron content varies between 61 and 64 percent and the amount of fines returned from the grizzlies is relatively low.

The two, Dwight-Lloyd, continuous sintering machines are 72 inches wide by 102 feet long with a hearth area of 616 square feet each. Until April 1951, a standard mixture of magnetite concentrates and coal was fed to the grate, with the usual swinging spout and leveling board,

to a depth of 8½ inches. This gave convolutions across the bed causing an uneven burn. Low spots were sintered very quickly while the areas packed by the leveling board would not, in some cases, sinter completely at all.

Sintering Practice Studied

A sintering time-temperature investigation was conducted and revealed very nonuniform results. Temperatures of the sinter bed, one inch above the grates, were measured simultaneously at three points across the width of the sinter machine by inserting thermocouples in the bed after ignition. These temperatures were recorded as the product of the sinter being tested progressed to the discharge end of the machine; in some cases, the machine was stopped to continue the test for a longer than normal period of time.

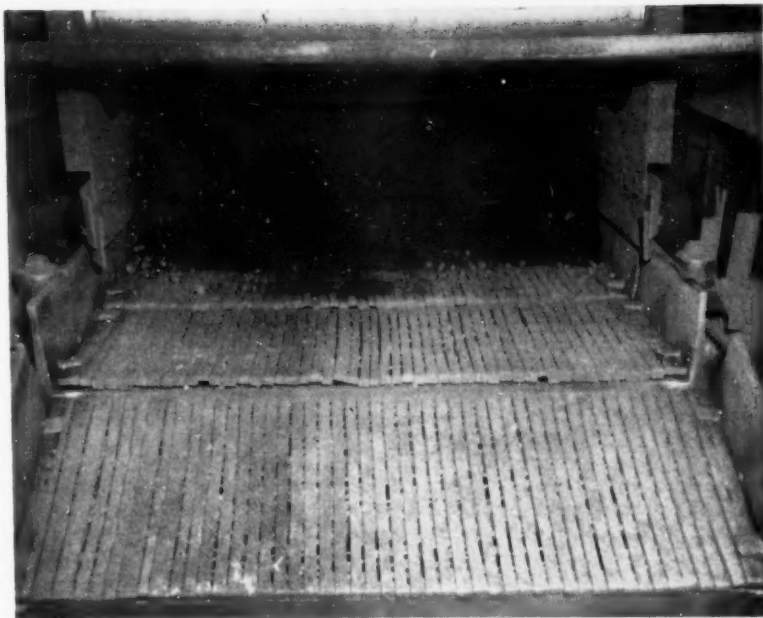
It was found that the low portion of the bed was completely sintered and cooled within the first five min-

utes after ignition, whereas the high portion required up to 18 minutes to sinter. It appeared that the sintering rate of the high section of the bed was greatly retarded after the low section was sintered, which indicated that much of the available air was passing through the porous sinter and was not available in the unsintered zones.

The results obtained during the study indicated that the swinging spouts being used to charge the machine were not particularly adaptable to the applying of a sinter bed of Benson Mines magnetite concentrates. Application of the material to the sintering machine in a manner to promote maximum uniform porosity appeared to have a very important bearing on sintering efficiency. To provide optimum operating conditions, it was necessary to apply a level, uniform bed to the grate of the sintering machine without packing the material.

Roll Feeder Developed

To accomplish this, the swinging spouts were replaced with a locally designed roll feeder arrangement. The 24-inch roll is fed at a controlled rate from a small hopper, which receives the sinter mix from the pug mill, placed directly above the feed end of the machine. An adjustable gate controls the depth of the material drawn from the hopper, and the speed of the roll is varied in relation to the speed of the sinter belt to give the desired depth of bed. The sinter mix drawn from the hopper by the roll falls on one inclined plate and then in a thin, even stream to the sinter machine grates. As the material slides off the plate, the large pieces of returned sinter segregate and roll to the grates before the main sinter mix. This provides a desirable, partial hearth layer of coarse material.



Roll feeder applying an 8½-inch bed to the pallet of the Dwight-Lloyd sintering machine. Note how the thin, uniform stream of material tends to separate as it reaches the grates with the large, returned sintering dropping on the grates where it forms a desirable bedding of coarse material.

More and Better Sinter

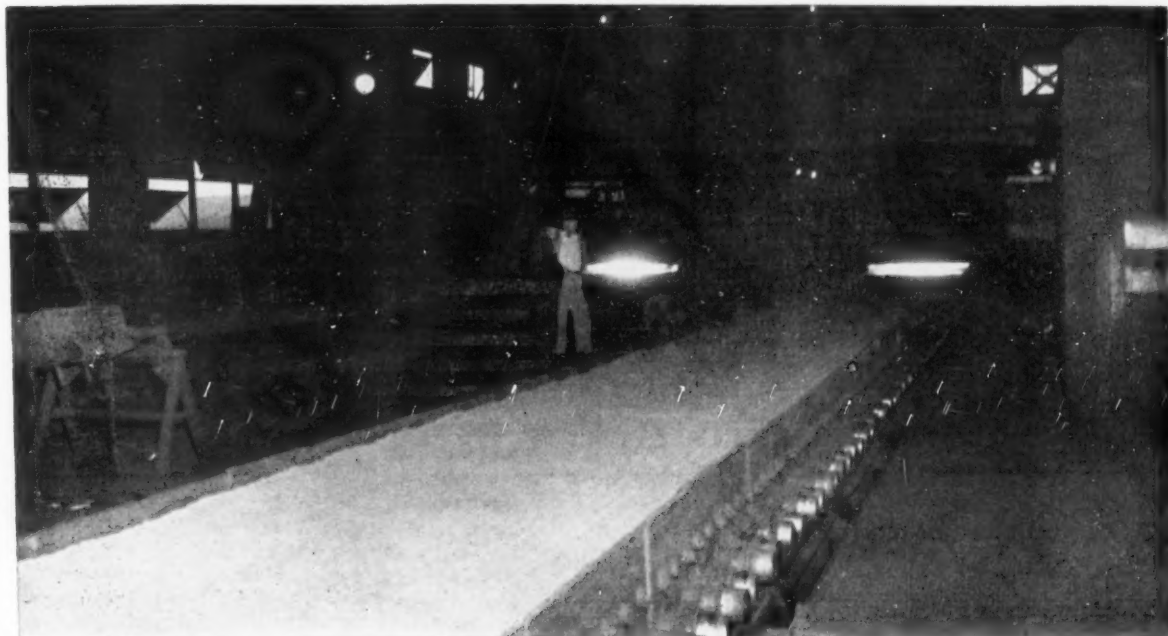
The operation of the roll feeders in place of swinging spouts has resulted in more uniform sintering. The average sintering rate was increased from 2.02 long tons per square foot of effective grate area per 24 hours in 1950, to 2.31 long tons with roll feeders applying the bed. In addition, improved physical properties of the sinter have been noted, and blast furnaces departments have

reported a decrease in the amount of fine sinter reporting to the lorry cars.

These figures on increased output, when translated in terms of the Benson Mine operation, indicate a 15 percent increase in the tonnage of sinter produced. This was made possible with no change in equipment except that of the feeder. With the

more uniform bed that the roll feeder provided, the speed of the sinter belt was advanced from 105 to 115 feet per minute. Actual tonnage of sinter increased from 785,000 in 1950 to 840,000 tons in 1951. The gain would have been larger except that the roll feeders were in operation only the last nine months of the year.

The general view of the Benson Mines sintering machine producing magnetite sinter. The expansion program includes the installation of one new sinter machine and a second will be added in the relatively near future.



SULPHUR—FROM ALASKA TO CHILE

North American Pacific Coast deposits are small and low grade, but those in Chile, Bolivia, and Argentina have great reserves for future mining

By Charles Scott Haley

Mining Consultant
Nevada City, California

A widespread search for additional sources of sulphur has been underway during the last 18 months, in spite of a record-breaking expansion of plant facilities at sulphur deposits along the Gulf Coast of the United States. Because of the increasing world demand for elemental sulphur, a large number of lesser known and smaller deposits extending from Alaska south along the Pacific Ocean to Chile are therefore becoming increasingly important.

In this article the South American sulphur deposits are dwelt on at great length because they are of the greatest future economic importance; in fact, they well may fulfill the basic needs of our manufacturing and industrial users, as well as fertilize our exhausted Western soils.

Alaskan Deposit Low Grade

On an island off the coast of Alaska, not far from Cold Harbor, a large deposit of low-grade sulphur has been known for half a century. It is close to deep-water transportation, but the best that could be expected here would be from 10 to 15 percent recovery,

even if large-scale surface mining methods were used. For this reason, the deposit has been left for the future.

To the south through the Yukon Territory and British Columbia there is nothing of economic importance, although pyrite deposits in this area may some day be used to manufacture sulphuric acid. The same applies for Washington, Oregon, and northern California, although in the latter state there are at least three somewhat isolated but large pyrite deposits.

Western Mines Operating

The Anaconda Copper Mining Company has acquired the old Leviathan sulphur mine, located in eastern Alpine County, California, and is developing it for large-scale production. The sulphur will be mined and trucked 60 miles to Anaconda's new Yerington plant in Nevada, where it will be used to make sulphuric acid for leaching of low-grade copper oxide ore. The deposit is reported to contain about 1,000,000 tons of 40 percent sulphur.

Another California deposit is in an isolated part of Inyo County, some 70 miles from the nearest railroad point and connected with the Tonopah-Reno highway by a very poor desert road. It is frequently cut off from the highway by cloudbursts, but it nevertheless

has been mined for soil-sulphur, running from 30 to 40 percent, for several years.

The Cody, Wyoming, operations of the Wyoming-Gulf Sulphur Company have been described in the May, 1952, issue of *Mining World*. In the same state, near Thermopolis, is a deposit on Owl Creek, not far from a railroad, which is now being operated to supply soil-sulphur to western farms. The late H. W. Turner estimated that over a million tons were indicated by drilling, but the deposit is not very deep and contains considerable active hydrogen sulphide.

Between 3,000,000 and 6,000,000 tons of low-grade sulphur ore suitable for shallow open-pit mining have been developed by the Chemical Corporation of America at Sulphurdale, Beaver County, Utah. A 200-ton-per-day pilot flotation plant is in operation.

Nevada Deposit Promising

Perhaps the best of the Western deposits, from an economic standpoint, is one located at Sulphur, Nevada, on the main line of the Western Pacific Railroad Company. The writer mined this deposit for several years and believes it to be at least 1,000 feet in depth. Undoubtedly several million tons of low-grade ore are in this deposit, which has been worked to shallow depth for some 80 years. The ore has an average content of about 25 percent, but a drill hole put down by the writer to a depth of 160 feet carried up to 35 percent sulphur. Several ineffective attempts at processing this ore for soil-sulphur at 10-mesh have been made during the past two years. However, the property still remains as a great potential asset if it is properly operated, and its proximity to the railroad adds greatly to its commercial possibilities.

Mexico and Baja California

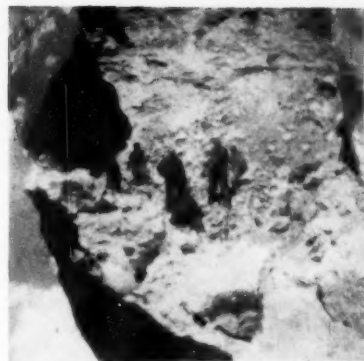
In the desolate, waterless country around San Felipe is another sulphur deposit which, if properly developed, might have a considerable yield. In the faulted and down-dropped valley sulphur shows along

The new sulphuric acid plant of Oscar Kohorn & Co., Ltd. has been placed in operation at Riobamba, Ecuador. Sulphur from the Tixan deposit, pictured here, is used.





←
LEFT: A working face at the Aucanquilcha sulphur mine high in the Chilean Andes. The maximum depth of this face is 66 feet.



→
RIGHT: This cut at the Aucanquilcha sulphur mine shows 56 feet of ore. Note the snow along the left side.

MINING SULPHUR IN CHILE



ABOVE: Sulphur ore exposed in a dry gulch at the Lopez property north of Ollague, Chile.



ABOVE: A face of 50 percent sulphur at the bottom of a 16-foot deep cut at the Flores property.



BELOW: Surface workings north of Ollague, Chile. The dumps average 40 percent sulphur.

A small steam autoclave plant is shown at the left.

BELOW: A sulphur ore outcrop high in the Chilean Andes shows as the light-colored area in the foreground.



the scarp. Located near deep-water transportation on the coast of the Gulf of California, it was held for many years by the old Union Sulphur Company of California. The sulphur deposit nearest this one is located about 70 miles southwest of Mexicali in the foothill ridges extending toward the Colorado River.

The great volcanic masses of Popocatepetl and Iztaccihuatl in central Mexico contain large deposits of volcanic sulphur, but here again inadequate transportation facilities have rendered them useless. Further south near the western coast of Guatemala volcanic sulphur exists in small quantities, but the Atlantic coast of Costa Rica, with its large deposit of low-grade sulphur, looks more promising. There is nothing of importance in Panama. In the western Cordillera of Colombia, a high-grade deposit exists which should be developed. It not only may be very large, but it is quite accessible from Barbacoas, a city in Narino province just north of the Ecuadorian border.

Ecuador Deposit Important

There is one major deposit in Ecuador near Tixan which is being developed by Chemical Plants Corporation. It is located only about five miles from a railroad, and furnishes materials for a sulphuric acid plant. Oscar Kohorn and Company, Ltd., international operators of rayon plants, are finishing the project. The next closest sulphur deposits are those in the volcanic beds of the Peruvian Andes, but, like those in Mexico, they are too inaccessible to render them of economic importance at the present time.

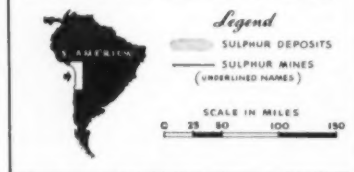
Great Reserves in Chile

Farther south, however, the transportation picture changes and it is the potentially important, commercially workable deposits of Bolivia and Chile that may well become the Western world's most important suppliers of sulphur when Gulf Coast salt dome fields are exhausted.

In northern Chile on the Arica railroad lies the Tacora district. Here, a deposit of high-grade sulphur is located which has been producing in steadily increasing volume for 30 years. A major problem is refining methods, since present wasteful ones are resulting in mining only of ore which runs 50 percent sulphur or better. A railroad trip south from Caleta Bueno would take one close to the Brazzale mine, the center of a large volcanic area containing many thousands of acres of volcanic sulphur deposits ex-



SULPHUR DEPOSITS Northern Chile and Bolivia



posed on the surface. This deposit, like the majority of those in Chile and Bolivia, is at an elevation of 15,000 feet.

Ollague District Mines

The most important producing mines of Chile at present are centered near the railroad station of Ollague. For 30 years, at least five major properties have been operating here on a small scale, using the old-fashioned, wasteful, steam autoclave system of refining. Consequently, many hundreds of thousands of tons of 40 percent ore are lying in dumps, with the firms concentrating on shipments of 90 percent ore to Antofagasta.

In northern Chile, known and unmeasured deposits of enormous size may be found at Napa Mountain, Lopez, Ocana, Irruputunga, Olca Mountain, Colla Huasi, Puquios, Cosca Mountain, Pelen, and Ollague Mountain. The largest deposit now being worked lies at Aucanquilcha, from which a cableway runs to the railroad at Amincha. The original discovery at Copiapo Mountain, first worked in 1879, is now abandoned because of lack of transporta-

tion, but it is estimated that several hundred million tons of medium-grade sulphur are still available there.

In some cases, the volcanos are almost intact, with the sulphur ores located in and on the flanks of the crater; in other cases, the cone has been destroyed and deposits of ore are found in the remaining depression. In places cracks several feet in width in the underlying rock are filled with almost pure sulphur. These veins ordinarily are not very deep, however.

The most important deposits spread over many thousands of acres on the flanks of the mountains, and are suitable for open-pit mining. An example is the ore deposit at Aucanquilcha, which runs in half-mile widths for a distance of three to four miles along the crest of the mountain. The owners claim 3,000,000 tons of ore of 80 percent grade, and more than 50,000,000 tons of better than 40 percent. At Buenaventura, it is estimated that there are at least 2,000,000 tons of 80 percent ore, and probably five times as much assaying 40 percent. At the Lopez properties sulphur is exposed on the surface for a length of 3,000 feet and a width of 2,000 feet. A probable tonnage of 50,000,000 exists here, all of which could be mined by shovel. At Chutunza, only nine miles from the railroad, lies an estimated tonnage of more than 20,000,000 tons of 60 percent ore which is as yet undeveloped. The surface outcrop at Chahuire covers an area one-half mile long and one-third mile wide, is all high-grade ore, and is only 15 miles from the railroad at Amincha. At Cerro de Olca, Polan, and Ocana are similar deposits.

It definitely may be stated that the volcanic sulphur deposits of Chile and Argentina (province of Salta) contain hundreds of millions of tons of ore which can be mined directly from the surface. At present good railroad service permits the Chileans to mine in the Tacora district and in Ollague, but good transportation by caterpillar and half track can be readily made available to all the districts listed above at moderate cost.

The writer has not personally visited all of these mines but has reliable reports on most of them. Looking back on some 30 years of sulphur mining and refining experience, he is convinced that not even the salt domes of the Gulf Coast are of more importance in the future than are these deposits controlled by our southern neighbors.



DIESEL ENGINES ON MESABI ORE TRUCKS STARTED BY AIR MOTORS

Following two years of rigorous field tests, one of the larger iron ore mining companies on Minnesota's Mesabi Range is turning to air starting motors for its big 20 and 30-ton ore trucks. On the basis of experience to date, it is estimated that the adoption of air starters will effect a saving of about 70 percent in electrical maintenance costs. Other advantages noted are: improved cold weather starting, greater ease in shop and field servicing, and simplification of electrical systems.

Cooperating in the application of air starting motors to heavy ore carriers were engineers of Ingersoll-Rand Company, the Euclid Road Machinery Company, and the mining company. First step was taken in the fall of



This compressed air storage tank is normally kept filled by the truck's own brake compressor. The tank is being filled from the garage's air system after a repair job.

1949 when a Model 9BM Ingersoll-Rand air starting motor was installed on a 300-hp. model NHRS600 Cummins Diesel powering a 22-ton rear-dump Euclid. This vane-type air motor develops from seven hp. with 75 pounds per square inch air to 16 hp. at 150 pounds pressure. Air is supplied by the truck's regular air brake compressor to an 11 cubic foot auxiliary air receiver. Since this compressor idles most of the time anyway, there is ample capacity to serve the starting system, keeping the receiver pressure at 150 pounds.

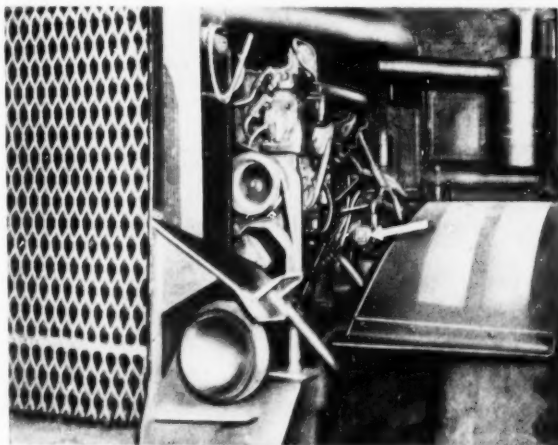
Later on they installed a Model 20BM air starting motor to crank the 400-hp. model NVH1200 Cummins Diesel on a 34-ton Euclid truck. This I-R air motor produces from 19 hp. at 75 pounds per square inch to 41 hp. at 150. Size of the air receiver had been reduced to 9 cu. ft. since this had proved adequate for starting requirements in the normal work schedule.

Reports are that air starting has eliminated many of the difficulties experienced with electrical starting systems. First, it has permitted replacement of the complicated and expensive 12- and 24-volt electrical systems with the simpler, more economical 6-volt systems. The costly 12 to 24 volt battery was essential equipment for electric starting but, with the cranking job taken over by air, the reduced electrical requirements can easily be met by the generator which produces 75 amperes at idle speed. Thus, the comparatively cheap 6-volt battery is in the line only as an accumulator and standby.

Providing enough compressed air for cranking has proven simple and easy under all conditions encountered. The trucks normally are in service day and night, stopping only for change of shifts, lunch hour, and maintenance. This involves an average of just six starts a day. On this schedule, the brake compressor easily keeps the air receiver supplied. If a truck is parked at the garage for a long enough period to lose its air, the tank is pumped up by the stationary garage compressor through an outside fitting on the truck's air receiver. If repeated stalls cause a truck to exhaust its air supply in the field, it is a simple matter to run another truck alongside and pump up the air tank of the stalled vehicle.

By contrast, if the battery runs down on an electrically-cranked truck, it is necessary to put in a replacement battery and charge the old one. The 24-volt batteries used on such vehicles as these weigh about 100 pounds and are installed eight feet above the ground. Replacement is not an easy job.

Cold weather starting is a major problem in an area where temperatures go far below zero. Experience has shown that after a truck has been parked overnight at

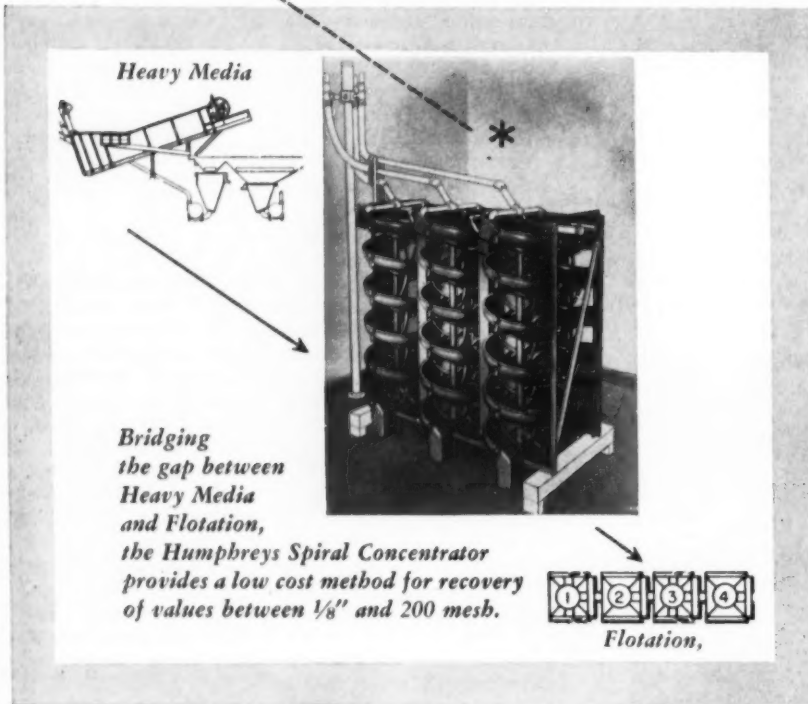


This Ingersoll-Rand air starting motor is on a Cummins 200-hp. Diesel engine on a Mesabi iron ore truck.

Low Cost Concentration

with the

Humphreys Spiral Concentrator



Heavy Media

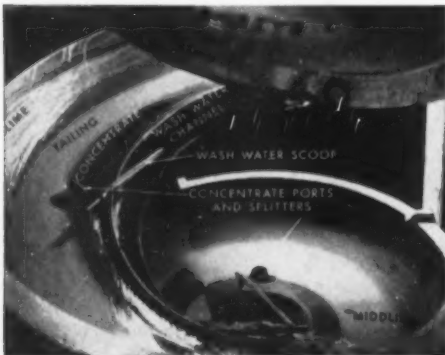
Bridging the gap between Heavy Media and Flotation, the Humphreys Spiral Concentrator provides a low cost method for recovery of values between 1/8" and 200 mesh.

Flotation,

- ★ for separation of minerals of different specific gravity in ores at sizes generally minus 10 mesh.
- ★ for recovery of liberated values too coarse for flotation.
- ★ for recovery of other ore values from flotation tailing.
- ★ for recovery of values too fine to be economically treated by heavy-media separation.
- ★ for cleaning minus 1/4 inch bituminous or anthracite coal.

Low cost of installation
Low operating costs
No moving parts

Concentrating action of Humphreys Spiral—
Note wide black band of concentrate entering upper outlet, which is set for a wide cut, also narrow black band of middling entering lower outlet set for thin cut. In cleaning fine coal, phosphate rock and mica, refuse and middling are discharged from the concentrate ports and cleaned product follows the path shown as tailing.



The installation, operation and maintenance costs of Humphreys Spirals are so low that economical concentration of materials, which could not heretofore be worked at a profit, is now possible. There are no moving parts, no vibration, weight per unit of capacity is low and requires only a light foundation. Floor space per ton treated is very small.

HUMPHREYS SPIRALS are widely used in plant operations in the United States and abroad, ranging from 30 tons to 20,000 tons daily capacity, for concentration of fine iron ore; for concentration of chromite, ilmenite, rutile, and zircon from sands; for concentration of ground ores for recovery of lead, zinc, chromite, copper, barite, mica; for concentration of molybdenum flotation mill tailing for recovery of tungsten; for separation of fine phosphate rock from sand; for cleaning minus 1/4 inch coal; for concentration of pyrite from flotation mill tailing; for concentration of fine gold and gold bearing minerals.

A testing laboratory is maintained in Denver by the Engineering Division of The Humphreys Investment Company. Results obtainable in a full size plant may be determined by tests of a representative sample of minerals or coal weighing 300-500 pounds.

THE HUMPHREYS INVESTMENT COMPANY

ENGINEERING DIVISION

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20 below zero, the Diesels should not be turned over by any means until they have been warmed somewhat since forcing would just tear up an engine. Even after putting a blow torch to the pan, however, engines may be hard to start. In such cases, it is easy to hook the truck to the air supply and turn the engine over as long as necessary. The use of shop-air to turn over an engine is also a convenience when a truck is undergoing repairs and adjustments.

On these trucks, the air receiver is mounted to the truck frame on the right side under the cab. Air is delivered to the receiver from the compressor through flexible rubber hose. A tee connection at the compressor and check valves in each air line keeps the starting air system independent of the brake air system and guards against loss of brake-air. Another length of flexible rubber hose connects the receiver through a quick opening valve to a globe valve in the cab and a third section of hose runs from the quick opening valve to the starting motor.

The air motor itself is compact, rugged and simple in design. Five vanes of special phenolic material seat in slots in a hardened steel rotor which turns in a cylinder of hardened alloy. The rotor is supported by ball bearings mounted in the bronze end plates. Dowels to assure perfect alignment complete the assembly. Compressed air enters and leaves through ports cut in the cylinder. The motor is designed so that any mechanic can disassemble and reassemble easily if repairs are necessary. The first test units were grease lubricated and had neither air strainer nor lubricator. Since no vanes or cylinders needed replacement in two years of service, it has been concluded that lubricators and strainers are not necessary and have not been specified on new equipment.

DIAMOND DRILL CORES SAWED FOR EASY STUDY AND STORAGE

A technique for cutting diamond drill cores with diamond-faced wheels has been developed by John Q. and William St. Clair while living in Africa and, more recently, in Minnesota. The technique was developed in conjunction with the design of the St. Clair Sampler, used with such success in cutting channel samples. (*Mining World*, August 1951.)

The principal advantage in splitting diamond drill cores with diamond wheels is that the cores may be divided longitudinally into *unequal* portions. This feature is important for many reasons. For example, the smaller segment (see sketch) may be kept for reference and study, while the larger segment or portion may be used for analysis. This gives more volume for assaying, an important consideration when it may be necessary to recover only a small core. For most cores which are relatively solid, a small segment measuring $\frac{3}{8}$ inch in thickness at its widest part is adequate for examination purposes.

In many ores on the Mesabi Range, for example, a sawed section gives a better surface for inspection than a surface produced by the conventional core-splitter. The sawed surface is very near to a polished surface, and this shows the banding much better than any uneven, broken surface. For permanent record, the sawed face may be coated with a clear lacquer, which eliminates the necessity of wetting the face with water for each inspection.

If the volume of core required for assaying purposes is critical, and where the hole must be as small as possible, an EX ($\frac{7}{8}$ inch) core split in this manner gives approximately the same volume as an AX ($1\frac{1}{8}$

inch) core split into two equal portions. Thus, smaller cores may be taken without sacrificing volume, and at lower costs per foot. This applies to other sizes in general.

With the type of core-splitter shown in the photograph, it is possible to split cores up to two feet in length without the necessity of breaking the core into short lengths as required with the mechanical splitter.

Core storage problems are considerably reduced, as shallow, light-weight boxes may be used instead of the large core storage boxes generally employed. Boxes measuring $\frac{3}{8}$ inch deep by two-feet long by six-inches wide will store 10 feet of AX core. The width and length dimensions may be altered to a more rectangular shape if desired, but the longer length of two feet enables this length of core to be filed.

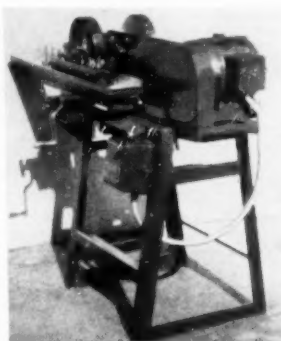
The weight of the boxes is important to any geologist or engineer who may have to wrestle with a great number of boxes during logging and inspection. The size just mentioned is convenient for desk use. For permanent record where frequent inspections may be necessary, a clear plastic cover ($\frac{1}{8}$ -inch thick) is an advantage, especially where the core is coated with clear lacquer, for rapid inspection may be made without removing the thin segments from the box. The cover also keeps the core in place.

Core storage racks, or cabinets, designed to hold the box size mentioned above and measuring approximately five-feet high, two-feet deep, and 10-feet long will store 24,000 feet of core. This is very important where core may be stored in offices or field quarters.

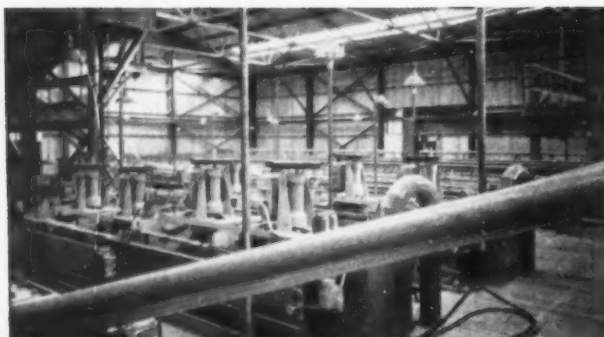
Where it may be necessary to orient each piece of core in order that the split may be made along the same portion of the core, this new method is most favorable. Cores which break up easily when broken mechanically, are more easily handled by this method; and the accuracy of the volume measurements of the larger portion of the core is considerably greater than when split in the normal manner.

In many cases, the mechanical method of splitting causes losses due to fragments flying off when tapped under pressure. In this new method, all of the core is recovered, except the portion cut away by the saw blade. This amounts to about 0.045-inch. In important intersections, this fine material may be collected if necessary. The speed of splitting will vary with the type of rock or ore being handled. Cutting rates may vary from two inches per minute to over two feet per minute depending upon the rock and the cross-sectional area of the core being split.

Costs will have to be determined for any particular rock, and can vary from a few cents per foot to considerably more in the harder quartz ores.



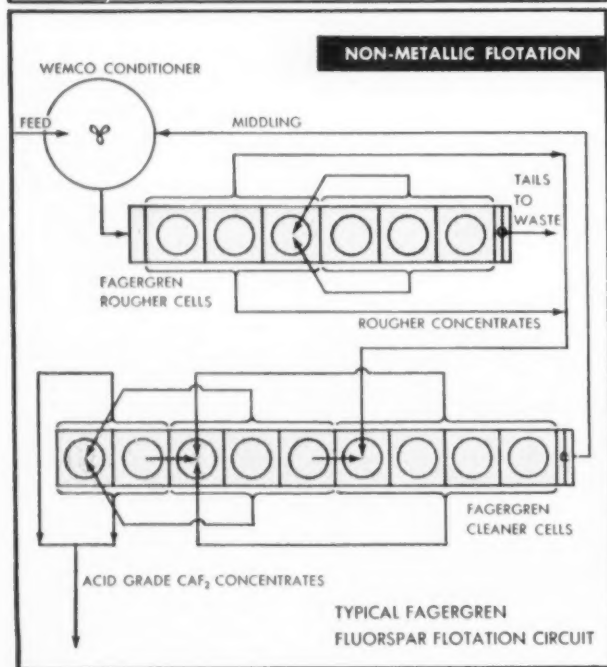
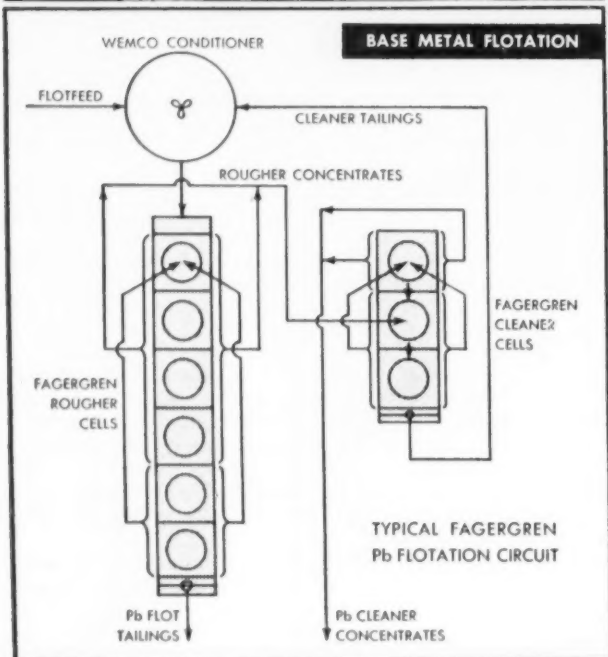
The core cutter uses eight-inch St. Clair diamond saws which are revolved at approximately 3,000 rpm. The electric motor is one-hp. Two feet of any sized core may be clamped in the holder; the depth of cut is regulated by lowering or raising the saw and motor unit which is hinged at the front end of the frame. The horizontal movement is controlled by a screw device, the handle of which is located in front of the machine near the operator. For some work, especially where the operation is carried out by one person, an automatic feeding device may be used to enable the operator to fill one core-holder while the previous core is being cut.



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Alaska Development Board Photograph

Gold placering in Alaska is typified by this gold dredge. Alaska Mine Commissioner Holdsworth predicts that placering operations will remain stable for the present.

ALASKAN MINE EXPLORATION RENEWS INTEREST IN TERRITORY'S WIDE VARIETY OF MINERALS

By Phillip R. Holdsworth

*Alaskan Territorial Commissioner of Mines
Juneau, Alaska*

Mineral production in Alaska in 1951 was valued at more than \$20,000,000. Once again, gold was the most important mineral. However, recent developments seem to indicate that in the years ahead gold mining may lose its top position. For one thing, although gold ranked first in value last year, with a total output estimated at over \$8,000,000, this was a drop of 25 percent from the 1950 figure.

Another factor threatening gold's position in the Territory is the recent announcement of the Aluminum Company of America in regard to its proposed Taiya Valley project which would make electrolytic refining of aluminum the largest single industry in Alaska. Great possibilities are also indicated in recent explorations for iron, tungsten, copper, nickel-cobalt, and chrome, while rapid expansion of the tin mining industry assures retention of Alaska's place as chief tin producer under the United States flag. The outlook for gold is far from "rosy," and no foreseeable change is anticipated for the near future.

OCTOBER, 1952



Phillip R. Holdsworth

In order to make gold mining attractive again, one of two things must happen: (1) the price of gold must be increased or (2) labor and materials costs must be drastically reduced. Overall mining costs have tripled in the last 10 years. It does not appear likely that the present fixed price of gold at \$35.00 per ounce will be raised sufficiently to al-

low the idle gold mines to resume operations. The only other answer is in lower labor and material costs. The time is fast approaching when military construction, which supports the present high wage scales, will come to an end or will taper off to a very small part of its present scope of work. When that time comes, and the resulting unemployment reaches a state where the individual will begin to offer a reasonable day's work at a reasonable scale of pay, gold mining will be able to resume its former status in the Territory's economy.

For the present, placer gold mining operations will most likely remain stable, although some placer operators have reached the conclusion that developed or proven ground is as good as "money in the bank"; i.e., that they will be able to net more from treatment of gravels at some later date.

Other Metal Activities

A look at the mining status of other minerals in Alaska is now in order. For instance, the Goodnews Bay Mining Company at Goodnews Bay continues to be the major platinum producer in the United States.



Alaskan mercury mining has centered at the New Idria-Alaska Mining Company's mine and plant shown here on the Kuskokwim River.

Although the annual production figures from this operation are not available, it is estimated to be near the \$1,000,000 mark each season.

Tin mining activities on the Seward Peninsula are on the increase. A new lode tin operation is just getting under way at Lost River. The U. S. Tin Corporation has just recently completed construction of a milling plant and is now treating material containing 2 percent tin with additional values in tungsten. The Zenda Gold Mining Company is prospecting on Cape Creek near Tin City with a joint company-DMEA exploration fund of \$60,000 and expects to begin a dredging operation there soon. The Northern Tin Company is recovering placer tin with a dragline operation on Buck Creek. Tin is also produced as a by-product from gold placer concen-

trates in other areas of Alaska. Continued exploration will develop more tin in this area but, until transportation facilities are improved, the grade of material that can be treated profitably will remain high.

Tungsten is produced from placers on the Seward Peninsula and exploration for lode tungsten is progressing, with DMA assistance, at Gilmore Dome in the Fairbanks area. The five-year guaranteed price of \$63.00 per unit will continue to make the prospector "tungsten conscious."

The Alaska Metals Mining Company has entered into a contract with the DMEA for a \$178,234 tungsten exploration program.

Antimony is found throughout Alaska and small-scale mining operations have been conducted intermittently for several years. The prin-

cipal operation has been the Stampede mine in the Kantishna district.

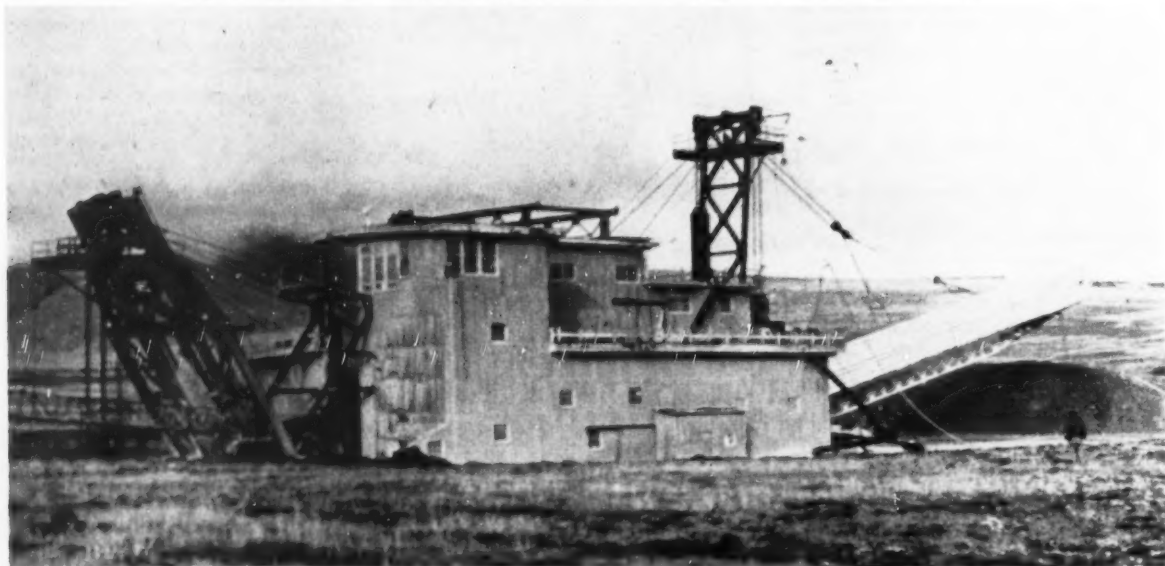
Alaska has a long history as a producer of copper but, at the present time, none of the "red" metal or its minerals is being produced or shipped from the Territory. The most important copper exploration project is the joint Alaska Copper Corporation-DMEA project with each participant supplying \$56,274.

Three Areas Merit Prospecting

The areas which appear most favorable for future copper production are as follows: (1) The Prince William Sound area in south central Alaska. (2) The McCarthy district in the Copper River region. (3) The Nabesna-White River region in east central Alaska.

In the Prince William Sound area, several former producers and other prospects indicate a possible tonnage of low-grade milling ore which could be treated locally in a custom mill. Several mines in this area have, in the past, produced comparatively high-grade copper for direct shipment to a smelter. Ore in the grade range of 2.0 to 3.0 percent copper can be profitably mined, transported a comparatively short distance by water, and concentrated in a custom mill, with the resultant concentrate being shipped to a copper smelter. An intense effort is being made by the various agencies to thoroughly investigate all possibilities of commercial-grade copper deposits in this area in an attempt to develop sufficient reserve tonnages to warrant such a mill. The concentrating plant could be constructed at one of the

Premier platinum producer under the United States flag is the Goodnews Bay Mining Company. This Yuba connected bucket line dredge with eight-cubic-foot buckets is operated by the company near the mouth of the Kuskokwim River.



properties or at a community center in the general area. With the current firm price of copper, and the present interest shown in Alaskan copper by large, well-established mining companies, it is felt that an industry is "in the offing" for the Prince William Sound area.

The McCarthy district is well known as a producer of copper as a result of the Kennecott operations which were suspended in 1938. Prospecting in this area remains active and will continue in spite of the existing transportation facilities. It is hardly conceivable that an area as large as this, and as favorable as it is geologically, would contain only one ore deposit, and that one now worked out. Exploration in this area is handicapped by a lack of access roads, and is dependent entirely on air transportation at the present time.

The Nabesna-White River district is one of the most promising base-metal areas in the Territory. Prospecting activities have been on the increase here in the past year and, with the Alaska Highway now bordering this area on the north, access is greatly improved. Construction of a comparatively short piece of road, connecting the Nabesna road with the White River crossing of the Alaska Highway would open up this favorable mineral belt and at the same time shorten the distance to Anchorage for those traveling north on the Alaska Highway. Representatives of three large mining companies have visited the area this year and increased activities can be expected here in the near future.

Chromite-Nickel-Mercury

Chromite is known to occur in the Seldovia area at Red Mountain and a definite tonnage of ore has been developed. Actual production from this area is at present being "held-up" for lack of approval on a government purchasing contract. For some unknown reason, the government is not willing to pay an Alaskan producer the same price for his product, delivered in Seattle, as is paid at the GSA ore purchasing depot at Grants Pass, Oregon. It is hoped that this "red tape" can be straightened out and shipment from the Seldovia area commenced next year. Chrome is also found in other areas of Alaska but deposits of commercial grade have not yet been developed.

Nickel is found in several places in the Territory. The most important deposit is found at Funter Bay on Admiralty Island in southeastern



Alaska Development Board Photograph
Native copper nuggets found in this stream, a headwater of the White River, near the Wrangell Range are indications of copper deposits. Geologists from several major mining companies have been searching for and investigating several promising Alaskan copper prospects this year.

Alaska. At this location a large, low-grade nickel deposit is under development with DMEA assistance by the Alaska-Admiralty Gold Mining Company under a program estimated to cost \$120,000.00. Production of a nickel-cobalt concentrate from a milling plant at Funter Bay is anticipated.

No mercury is being produced in the Territory at the present time but Alaska has produced some tonnage in the past. Interest has recently been revived in mercury deposits near Sleitmut in the Kuskokwim Valley.

Iron Ore Developments

Iron ore in the form of magnetite is found in several parts of the Territory but the most important known deposits are found in Southeastern Alaska. Some 2,000,000 tons of copper-bearing magnetite are known in the Kasaan Peninsula area on Prince of Wales Island. A large deposit of titaniferous magnetite is known to exist at Port Snettisham just south of Juneau. The largest, and by far the most interesting, occurrence is known as the Kluckwan iron deposit 23 miles from Haines on the Haines cut-off of the Alaska Highway. This deposit is at present being developed by a Seattle firm of importers and exporters with the object in mind of shipping high-grade magnetic iron ore to Japan. In order to do this economically only exceptionally

high grade or clean magnetite must be recovered in coarse sizes with some very simple or economical method of concentration employed. There are some concentrations of fairly clean magnetite in this enormous deposit but only a comparatively small part of it will be adaptable to the method of recovery intended for export. In my opinion, this large, relatively low-grade deposit can be economically utilized only on a local basis. The actual size and grade of the deposit is not yet known but it lies somewhere in the range of 3,000,000 tons per foot in depth and may average 15 percent magnetic iron. Recovery of magnetic iron from this deposit, suitable for use in the steel industry, would require grinding and magnetic separation. The resultant fine-magnetite would then have to be sintered for use in the blast furnace.

Industrial Area Foreseen

A steel industry in the Haines-Skagway area would create a more economical outlet for the Seldovia chrome, Funter Bay nickel and cobalt, Fairbanks and Seward Peninsula tungsten, and all the other alloying metals found throughout the Territory. The availability of large amounts of cheap electrical energy from, let us say, the proposed Taiya Project would eventually lead to other comparable industries in this same area.

For the Taiya Project, the Alumi-

num Company of America has announced plans to spend \$400,000,000 to develop hydroelectric power and build a 200,000-annual-ton aluminum plant. Both the United States and Canadian governments will have to approve certain features of this project before construction of the Miles Canyon Dam on the Yukon River, driving of 13 miles of water tunnel, building of two underground 800,000-hp.-each power plants, and erection of the aluminum plant can commence.

A tin-tungsten recovery smelter would enhance the value of the Seward Peninsula deposits. A copper smelter would result in increased ore reserves, resulting from lower shipping and treatment costs.

The need for more roads in Alaska is obvious. It is very true that the natural resources of Alaska cannot be developed until access is provided to the known mineralized areas throughout the Territory. When we speak of roads we do not always mean first class highways. In the exploration for, or development of, mineral deposits an access road, sufficient to move drills, portable compressors and power plants, and miscellaneous light equipment, is all that is required. Without these rough access roads, the prospector or miner is dependent on air transportation to isolated mineralized areas. As a result, development of Alaska's resources will be nec-

essarily geared to that of road construction.

Nonmetallic Opportunities

In the field of nonmetallics, Alaska has known deposits of limestone, gypsum, clays suitable for brick manufacture, asbestos, barite, graphite, pumice, "expansive" shales, sulphur, building stone and, of course, sand and gravel. Alaska has been slow to develop these deposits and also to develop a local market for the resultant products. It may be that we have "missed-the-boat" to the extent that these products could have been applied to the huge military construction program, which may run its course in the next few years. But Alaska will still continue to grow and expand its industries, and the individual must realize, especially in this field of nonmetallics, that it generally takes as much time and money to develop a market for your product as it does to develop your raw materials and construct a processing plant. Capitalization for a new industry must be sufficient to cover the period necessary for this, if it is to succeed.

Prospector's Aid Program

Now as to the field of prospecting which is so necessary to develop our natural resources, Alaska today finds itself in an odd position. The real, old-time, Alaskan prospector of 20 to 50 years ago is getting to

the age where he is no longer physically able to "rough-it" in the field as he used to. At the time when he was active, he was looking for only one thing—gold. He had no interest in other metals or minerals, and even if he had, minerals of major importance in his time would have been somewhat different than those which are of importance to us today. Since the oldtimer's period of activity, we have gone through a period of war, followed by military construction activities which offered high wages on construction work. The present generation has been so used to good living and high wages that the field of prospecting has been ignored. As a result there are few real prospectors in the Territory today who could carry on an intelligent program of mineral development. The United States Geological Survey, U. S. Bureau of Mines, and Alaskan Territorial Department of Mines are, of course, carrying on field investigations and aiding those who request assistance in development of prospects; but private prospecting must be promoted. A prospector's aid program should be backed and supervised on a Territorial level. Several programs have been studied and discussed with the Alaska Development Board and active mining men. A program similar to that used in Saskatchewan Province of Canada should net the most favorable results. Here, prospectors apply to the Department of Mines for authorization to prospect under the program. The individual must have had some technical education along this line, or have attended the mining short-course offered each year. The applicant posts a \$100.00 bond to show his good faith and also arranges his own credit with a merchandizer to cover supplies needed. The government furnishes air transportation to the field, flies supplies to him once a month, designates the general area he is to prospect, analyzes his samples, and otherwise gives him professional advice in directing his work. This program has "paid-off" for the province of Saskatchewan as figures obtained by the Development Board show. I also feel that the staff of the Territorial Department of Mines should be increased in size to adequately cover a Territory as large as Alaska, particularly if some such prospector's aid program is to be administered.

With this type of teamwork, I definitely believe that the mining industry in the Territory of Alaska could be on the threshold of a new era.

Realizing that the prospector is Alaska's forgotten man; that the mining industry cannot progress without him, the Territorial Department of Mines and Alaska Development Board are urging that some form of Territorial assistance be provided to encourage exploration.

Alaska Development Board Photograph



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PILOT CONSTRUCTION AA

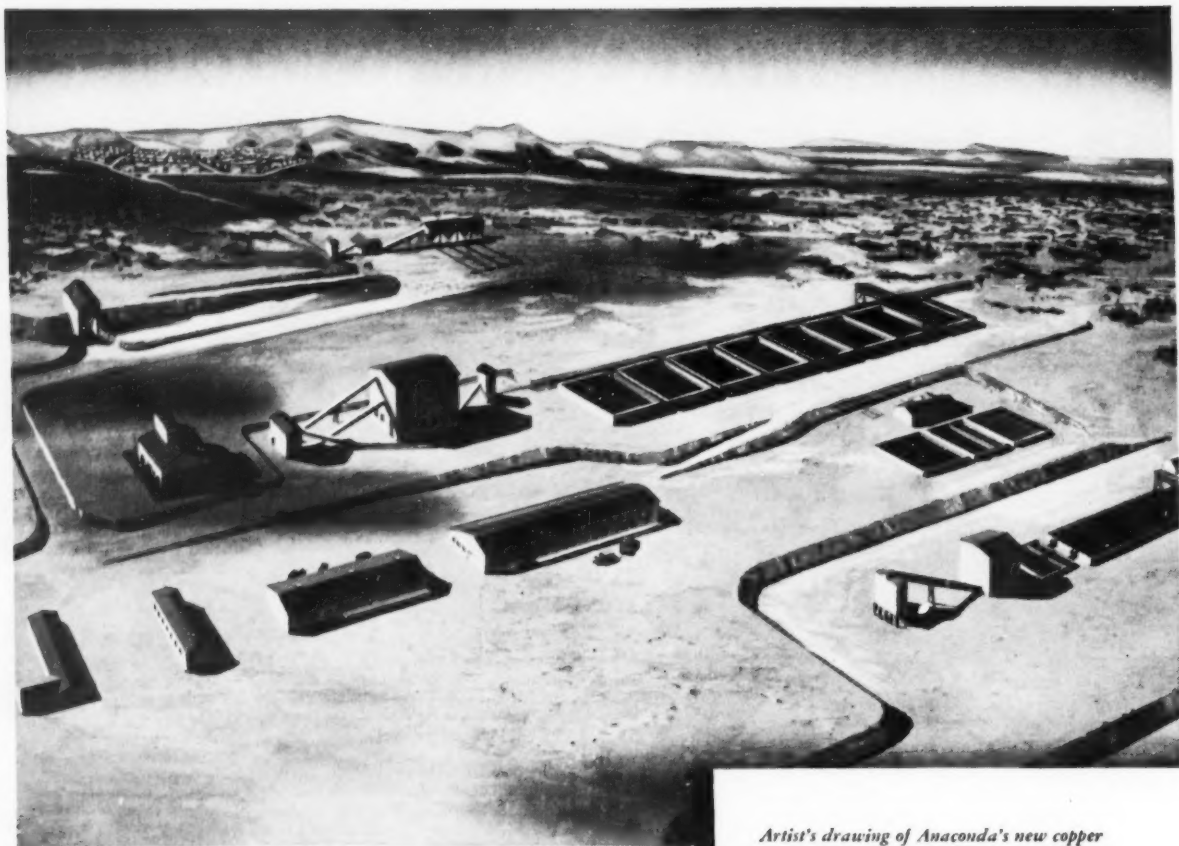


Section "AA", along the high-centre wings. Section "BB", along the low-centre wings.

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EVERY LITTLE BIT COUNTS



Artist's drawing of Anaconda's new copper mine and precipitation plant now under construction at Yerington, Nevada. Here open-pit mining of copper oxide ore will produce an estimated 66,000,000 pounds of copper annually. Production is scheduled to begin at Yerington late next year.

Pay-Dirt in Nevada!

The development of new ore bodies plays a vital part in Anaconda's expansion program. The Yerington property was explored and acquired by the Company during the early 1940's. Its current development is one of several Anaconda projects undertaken to increase the production of copper.

In addition to expanded mining activity, Anaconda's post-war program includes new developments in metallurgy and manufacturing. For instance, large scale modernization of

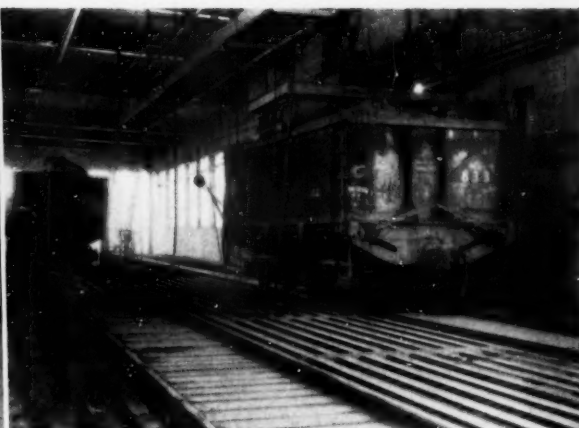
manufacturing facilities results in steadily improving service for customers of Anaconda subsidiaries. At the same time, application of new mining and metallurgical methods is increasing production of all major metals in the Anaconda family. As metals grow in importance to the nation's future economy, so grows Anaconda.

Anaconda Family of Metals—Copper, zinc, lead, silver, gold, platinum, cadmium, vanadium, selenium, manganese ore, ferromanganese.

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LEFT: Sand filling a mined-out, square set stope at the Frood-Stobie mine of the International Nickel Company of Canada, Limited, Sudbury district, Ontario, Canada. Some 3,000 tons of filling per day is now being placed in stopes down to the 3,100-foot level. RIGHT: Unloading 78-ton railroad cars full of dewatered tailing at the sand-fill mixing plant at the Frood-Stobie mine. The tailing is pulped with water and pumped underground for filling.

INTERNATIONAL NICKEL SAND-FILLS STOPES FOR FASTER MINING AND PILLAR RECOVERY

The International Nickel Company of Canada, Limited is now using sand filling at two of its five underground mines in the Sudbury district, Ontario, Canada.

At the Frood-Stobie mine, sand filling has replaced waste rock fill used for 20 years. Sand filling is superior as its use permits faster and more efficient mining operations. The sand fill (flotation tailing) packs solidly in the mined out areas and builds up uniformly to form a nearly level, flat floor from which the next mining cut can be taken. The sand fill has proven to be strong enough to sustain the increased weight as ore pillars between filled stopes are removed.

Creighton Mine

Flotation tailing from the new 10,000-ton-per-day flotation plant (November 1951 issue of *Mining World*) is pumped underground to all parts of the mine. Some of the square set stopes now being filled are 9,500 feet from the mill with the fill travelling some 5,000 feet horizontally through the mine drifts.

Frood-Stobie-Mine

At this mine, 3,000 tons of sand being used every day for filling square set stopes currently being mined and also for filling the voids in old waste rock filled stopes. It is estimated that it will take 3,500,000

tons of sand to completely fill and stabilize the mine's old stopes.

Dewatered sand tailing for use at the mine is shipped from the Copper Cliff flotation mill in 78-ton-capacity railroad cars. A special plant has been built for pulping the dewatered tailing so that it can be pumped underground. The pulp, 60 percent solids, from the mixing plant is fed to three six-inch, rubber-lined distribution lines which enter the mine through a service raise. On each level, down to 3,100 feet, distribution lines extend to the stopes from the main line.

Burlap Lined Bulkheads

A section of stope to be filled is bulkheaded off and lined with burlap. The water rises to the surface as the sand settles and decants through ports in the burlap lining. These are progressively closed as the fill level rises. The water collects in the level ditches and is pumped to surface.

An independent telephone system provides direct communication between the stopes and the surface sand-fill pulping plant to control the time and rate of sand-fill delivery.

Mined-out sections are bulkheaded and sealed with brattice cloth to confine the filling. As the sand settles, the water overflows through special ports cut in the lining.



RESISTO-LOY Reduces Excessive Maintenance Costs

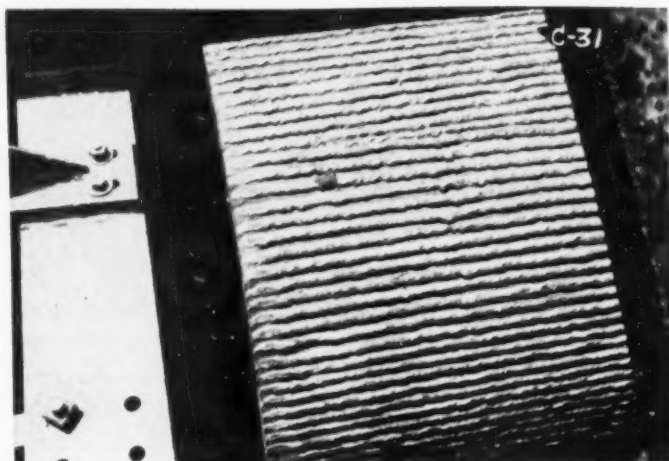
on CRUSHER ROLLS

In the use of RESISTO-LOY on manganese crusher rolls, the old rule applies—"It's not the first cost, but the upkeep that counts". If you are crushing large tonnages of hard materials daily, and if you are forced to maintain the rolls constantly, we can put a stop to the excessive costs of such maintenance. In the American way, the good old competitive way, we can be sure of one thing—"we get just what we pay for".

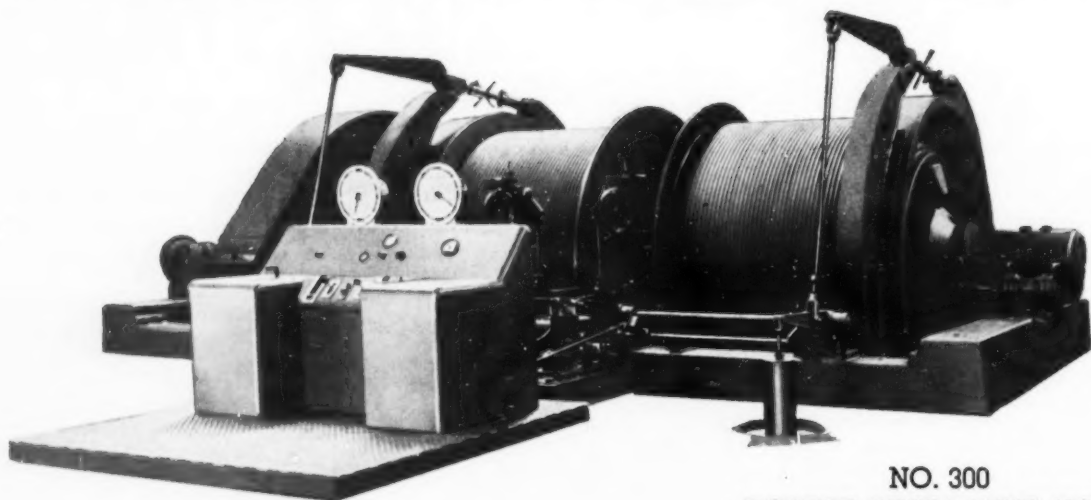
Regardless of price, we invite you to prove that statement to your own complete satisfaction. Good things DO cost more, and if you want the satisfaction obtainable from a composition of the finest metals available, then you can get this satisfaction from RESISTO-LOY.

The above illustration shows the correct application of RESISTO-LOY to produce $\frac{3}{4}$ " minus materials. This is a job your plant welder can efficiently handle. Call in our Field Man. Let him show you how to cut maintenance costs on your rolls. He is a Specialist. You can count on his advice and recommendations.

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LEFT: First gold ore from the "B" vein is dumped from the bucket. A bulldozer spreads the dump away from the shaft. RIGHT: Salmita Consolidated Mines Limited delivers fresh food and mine supplies to its crew with this hydroplane.

GOLD IS WHERE YOU FIND IT

This series of photographs illustrates the aggressive spirit of the Canadian mining industry in finding and developing gold mines far north of centers of civilization.

The only land mark of civilization in the barren lands which stretch for hundreds of miles north of Yellowknife Town is the headframe and buildings of a gold-tungsten mine under development in the McKay-Courageous Lake area by the Salmita Consolidated Mines Limited about 150 air miles northeast of Yellowknife. It is believed to be the first underground development ever done north of the "tree limit" in the barren lands.

Diamond drilling from the surface disclosed several ore zones, and un-

derground development through the vertical shaft was started on the "B" vein at a depth of 125 feet.

Lakes dot the nearly flat, wind-swept, barren lands and afford landing spots for ski equipped planes when frozen, and for hydroplanes during the summer. A total of 110 tons of equipment was flown in by D.C. 3's landing on the ice of nearby Matthews Lake during 1951.

Salmita has no trouble finding its mine crew for the daily shift because, as the foreman says "The McKay-Courageous Lake area has no temptations for the miners, why the nearest 'bright lights' are 150 miles away." The one thing that can and has extended the "bright lights" in Canada is mining.



An air leg, mounted jackhammer is used to drill a drift round. Note the frost incrustated face and back.

LEFT: The pre-fabricated headframe is bolted together to facilitate transportation and erection. RIGHT: Two miners lowered to the 125-foot level new sinter machine and a second will be added in the relatively near future.



John D. Mitchell Tells of

LOST MINES AND BURIED TREASURES DOWN TO THE SEA IN SHIPS



Many of us are pirates at heart and sea rovers who long to go down to the sea in ships. Pirates and pieces of eight, the Jolly Roger on the Spanish Main, an ancient chest and an old sea chart, a beautiful tropical island in the far-off Pacific—these are the dreams of Eternal Youth.

For more than a century, this combination has lured adventurers from all over the civilized world to Cocos Island to search for buried treasure. Cocos is a small island in the Pacific Ocean, located about 400 miles west of Colombia and 250 miles north of the equator. For years it was the hideout for pirates and buccaneers, and many a sailor had walked the plank at Cocos Island. Wild and blood-curdling are the stories of happenings there before Captain Graham was sent out by Great Britain to bring law and order. Captain Graham, so the story goes, was so captivated by the island that, after chasing off the pirates, he turned buccaneer himself.

In addition to the many caches of pirate loot, there is said to be \$60,000,000 in precious gems and gold and silver bullion buried somewhere on the island. This treasure

belonged to the Peruvian government and was taken on board a warship for safe-keeping when a revolution broke out in 1823. To keep the treasure from falling into revolutionary hands when a rebel ship gave chase, it was buried hurriedly on Cocos Island.

On the return trip, the warship was captured by the rebels and sent to the bottom of the ocean with all hands on board. The question now is, what became of the great treasure? Presumably, it has never been taken away and still lies buried somewhere on the island.

Many expeditions outfitted at great expense have sailed away to this beautiful little island in the South Seas to search for the treasure. The fact that all of these expeditions have returned empty-handed has not deterred others from looking for this pot of gold at the rainbow's end.

Cocos Island has no native population and now is owned by Costa Rica. Cocoanuts, palmettos, berries of many kinds, and wild pigs constitute most of the available food supply to be found there.

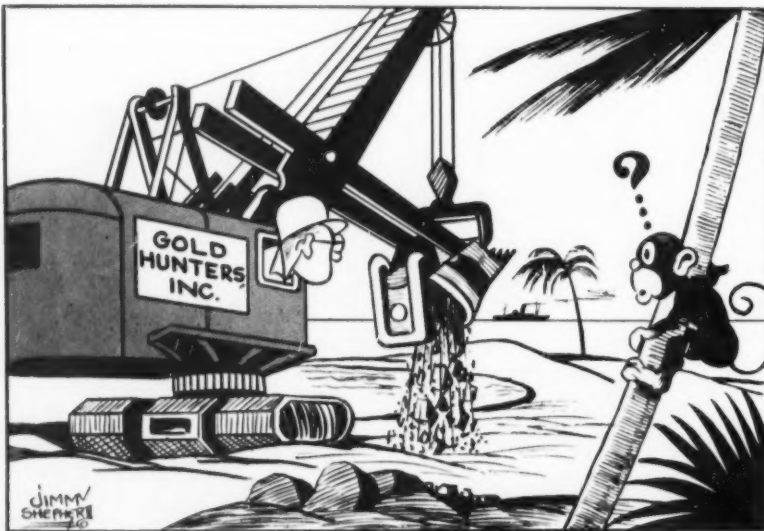
Treasure hunters are romantic persons who enjoy the thrill of the

hunt, even though they do not find the elusive treasure.

Various kinds of "doodle-bug" instruments have been employed in the search for the Cocos Island treasure. Some of the expeditions, however, have gone about it in a more business-like manner and have even employed steam shovels. It was the custom in those early days to shoot down the poor slaves who helped to bury the treasure, and reports say that some human bones were scooped up by these steam shovels. Dead men tell no tales, but the finding of their bones would seem to indicate that the treasure hunters might have been near their goal. Many treasures have been located with the bones of long-dead slaves sprawled over the iron-bound chests.

There are those who say that the Cocos Island treasure was lifted years ago and buried in a cave on the Oregon coast. Despite this fact or fiction, other expeditions will sail away to this beautiful tropical island to search for the \$60,000,000 in gold and silver coin and plate and precious gems stored away in the iron-bound chests of Cocos Island.

Some of the expeditions have gone about it in a modern business-like manner and have even employed steam shovels.



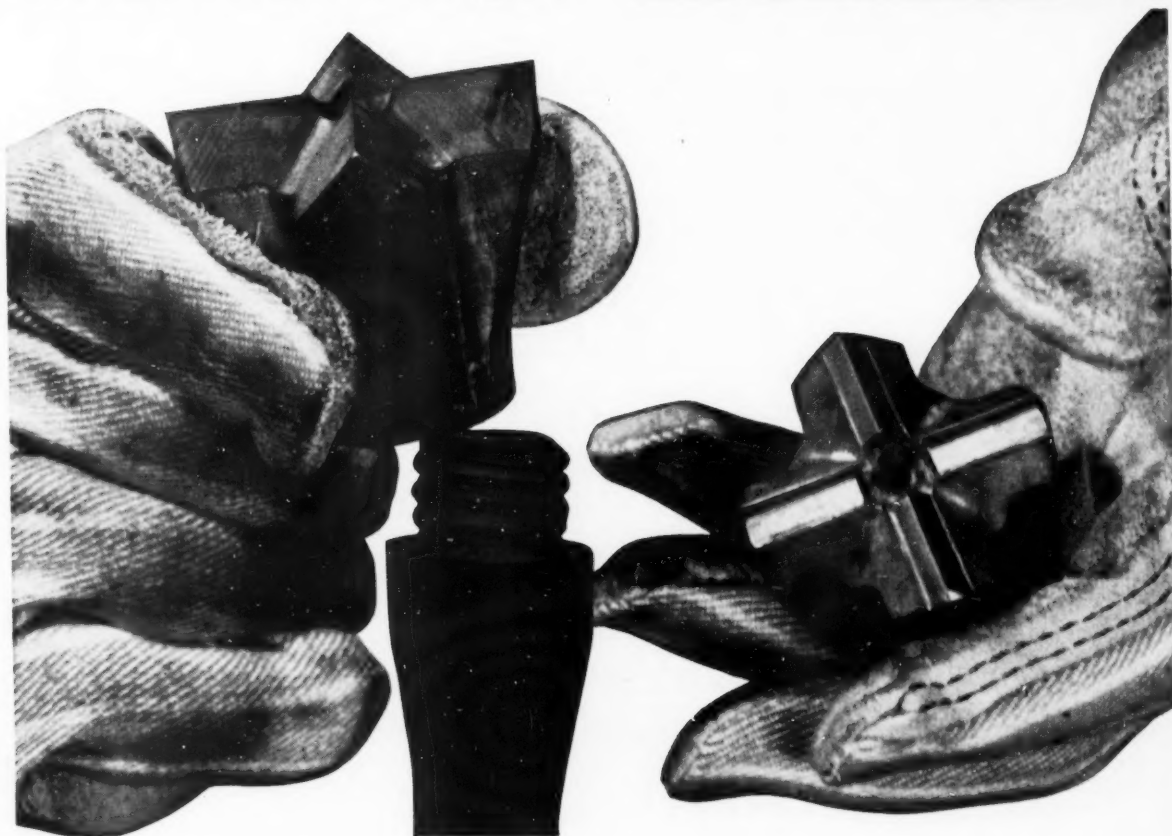
Eagle Picher Mine Shaft Completed In Wisconsin

The Eagle Picher Company has completed its 20 by 14 foot incline shaft a total distance of 1,900 feet into the Birkett zinc-lead mine, 1½ miles northeast of Hazel Green, Wisconsin. The incline was driven within 12 feet of an old vertical shaft which was tapped to provide water for drilling.

A 21 by 36 inch Rogers Iron Works crusher has been installed underground, and, after primary crushing, a 237-foot conveyor will deliver the ore to two 250-ton boppers for loading into trucks. The Diesel trucks will haul ore up the 10-percent grade of the incline to the surface, then eight miles to the Graham-Snyder mill of Eagle Picher in Galena, Illinois. Initial production will be on a 400-ton basis, later to be increased to 800 tons daily.

The company has also started work on a 14 by 16 foot truck haulage drift from the south end of the Graham mine to the Graham-Ginte mine, 900 feet to the southeast.

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ACTIVITIES OF U. S. MINING MEN

LEON W. DUPUY, mining engineer, is the new coordinator of mineral resources studies for the U.S. Bureau of Mines, Department of the Interior, in Washington, D.C. Before this, Mr. Dupuy was special assistant to Dr. C. W. Selbel, regional director of Region VI, Bureau of Mines, in Amarillo, Texas. He was promoted because of outstanding work in connection with the Arkansas-White-Red River Basins program in the Southwest.



M. E. Willmott has been appointed resident manager of the Ford Motor Company's northern mining lands, large tracts of which are located in Baraga, Marquette, Iron and Dickinson counties in Michigan.

Koehler S. Stout is a new professor in the mining department of the Montana School of Mines, filling a vacancy created by the death of Professor O. A. Dingman last December. Mr. Stout received his A.B. from Montana in 1948 and his M.A. in 1949, and more recently, was mine captain at the Mount Hope Mine of the Warren Foundry and Pipe Corporation of Dover, New Jersey.

Rollin Smith, manager of Titanium Metals at Henderson, Nevada, and **A. E. Millar**, of Anaconda Copper Corporation's Yerington, Nevada operations, are new members of the advisory committee of the Mackay School of Mines, University of Nevada. Other members include **Roy A. Hardy**, Getchell Mining Corporation; **Herman Budelman**, Nevada state senator; **John C. Kinnear, Jr.**, general manager, Kennecott Copper Corporation at McGill; **Bruce A. Gould** of the H. W. Gould Company, mining engineers in San Francisco; **Louis Gordon**, Nevada Porphyry Gold Mines, Inc.; and **H. P. Eells**, president, Basic Refractories.

Edward Eidam has been named mechanical superintendent of the Snyder Mining Company at Hibbing, Minnesota. He succeeds **Aton Tancig**, who has retired.

John D. Morrison and **John M. Foster** has been elected to the board of directors of the White Pine Copper Company in northern Michigan.

J. Murray Johnston has been appointed manager of the Titanium Alloy Manufacturing Division of National Lead Company, succeeding **Winthrop Sargent, Jr.**, who will continue as director.

Franz T. Stone has resigned as deputy administrator of the National Production Authority, and will return to his position of president of Columbus McKinnon Chain Corporation of Tonawanda, New York, and Dixon, Illinois. Mr. Stone has been with NPA since April, 1951.

Three men have been elected to the

board of directors of the Idaho Mining Company. Chosen for one-year terms were **Ben Zimmerman** of Poplar, Montana, **L. E. Beeson** of Spokane, Washington, and **C. Aubrey Grissom** of Salinas, California. Mr. Zimmerman is president of the firm.

Hewitt Smith has been named vice president in charge of operations of the Woodward Iron Company of Birmingham, Alabama. **John W. Hager**, former chief mining engineer, is new general superintendent of mining. **Thomas H. Kirk** succeeds Mr. Hager as chief mining engineer.

Robert E. Vervaeke, manager of U. S. Gypsum Company's Evans, Washington, plant for the past eight years, has resigned to become operating vice president of the Quincy Corporation, manufacturer of diatomaceous earth products in Quincy, Washington. Mr. Vervaeke will be succeeded at Evans by **Macy Smith** of Falls Village, Connecticut.



A. G. WOLF has been elected a vice president of the Texas Gulf Sulphur Company. Mr. Wolf spent 12 years in the metal mining industry in the western states, primarily Colorado and Nevada, before joining Texas Sulphur 33 years ago. When the firm opened offices in Houston, Texas in 1925 for the purpose of acquiring new properties, Mr. Wolf was placed in charge of this work. On his recommendation, sulphur reserves were obtained in several salt domes, including one at Boling, Texas, now the chief mine of the company. The geological exploration department was greatly enlarged in 1951 with Mr. Wolf as manager, in order to expand the company's search for new sulphur reserves.

Thomas M. Ware and **Edward D. McDougal, Jr.**, have been elected vice presidents, and **C. M. Edwards** was elected secretary of International Minerals and Chemical Corporation. **Charles P. Loucks** has been made production manager of the eastern clay products department of International Minerals and Chemical's industrial minerals division, and **John D. McKenzie** is the new assistant to **Norman J. Dunbeck**, vice president of the industrial minerals division.

Alan Sharp, formerly with the U. S. Bureau of Mines safety division in Arizona, is assistant mine foreman for the New Jersey Zinc Company at Gilman, Colorado.

Members of the Ferro Manganese Industry Advisory Committee are at present considering action to eliminate a serious problem within the industry caused by increased prices of ore in foreign lands which is forcing domestic producers to sell at a loss. Members of the committee include **J. P. Beattie**, Tennessee Products and Chemical Corporation, Nashville;

R. H. Cromwell, Electro Manganese Company, Knoxville; **E. H. Klein**, New Jersey Zinc Sales Company, Inc., New York; **James MacBeth, Jr.**, U. S. Steel Company, Pittsburgh; **Walter E. Remmers**, Union Carbide and Carbon Corporation, New York; **Ivar D. Sims**, Bethlehem Steel Company, Inc., Bethlehem; **Albert O. Sowerine**, Anaconda Copper Mining Company, New York; and **R. N. Ward**, E. J. Lavino Company, Philadelphia.

Fansteel Metallurgical Corporation has made the following changes in its staff: **Robert J. Aitchison** was elected chairman of the board of directors of Fansteel and its subsidiary, Vascoloy-Ramet Corporation; **Dr. Frank H. Druggs** was elected president of Fansteel and its subsidiary, Weiger Weed and Company; **Dr. R. Winchester** was named to succeed Dr. Driggs as director of the technical division; **Herbert B. Clark** was elected president of Vascoloy-Ramet; **Harry W. Highriter** was made vice president of Vascoloy-Ramet; **Glen Ramsey** was elected vice president of Fansteel; **John Meade** was appointed vice president of Fansteel in charge of industrial relations and **Joseph A. Teece** was re-elected vice president in charge of manufacturing; **Harry D. Weed** was elected vice president and general manager of Weiger Weed and Company; **Erich F. Radke** was re-elected secretary and treasurer of Fansteel-Vascoloy-Ramet and of Weiger Weed; **George W. Swanson** retains his position as assistant secretary of Fansteel.

R. S. Walker, consulting engineer, and **Charles Maier**, fleet engineer, both members of the M. A. Hanna Company Cleveland staff, are in England visiting the shipyards of the Furness Shipbuilding Company at Birmingham and the Swan Hunter Company at Newcastle. Each of these yards has a contract to build one of the two new 31,000-ton ore vessels which will carry Labrador iron ore.

LUTE J. PARKINSON has been named new head of the mining department of the Colorado School of Mines at Golden, Colorado. He succeeds **CLIFTON W. LIVINGSTON** who resigned to form his own mining company. Mr. Parkinson



has had extensive experience in the mining industry. For many years he was associated with Companhia de Diamantes de Angola in West Africa. In Africa he was also employed by Cape Coast Exploration Company, Anglo American Corporation of South Africa, Daggafontein Mines, Ltd., De Beers Consolidated Mines, Ltd., and in South America by Braden Copper Company and Kennecott Copper Corporation. He resigned from his position as mining consultant to Anglo-Chilean Nitrate Corporation and the Lautaro Nitrate Company, Ltd. at Antofagasta, Chile, to accept his present assignment.

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dealing with sulphur. (The Wyoming operation was described in **MINING WORLD**, May 1952.) Mr. Marquette may be reached at 5716-17th N.E., Seattle 5.

W. H. MARQUETTE, formerly president and general manager of Wyoming-Gulf Sulphur Corporation at Cody, Wyoming, has opened a private consulting practice in Seattle, Washington, where he will specialize in problems

Richard Schaal, chief mechanical engineer, and Onnie Marjama, superintendent of the Cliffs shaft, Cleveland Cliffs Iron Company, are taking a mine inspection trip in Sweden and Lapland. Maxwell Madson, mining engineer, and Erick Pex, geologist, members of Cleveland Cliff's Ishpeming, Michigan, staff, recently returned from an inspection trip to Venezuela.

George M. Potter, metallurgist at the Salt Lake experiment station of the U. S. Bureau of Mines, has been named technical assistant of the foreign minerals region of the bureau at Washington, D. C.

J. B. Haffner, general manager of Bunker Hill and Sullivan Mining and Concentrating Company at Kellogg, Idaho, has been elected to the Idaho Custer Mines, Inc., board of directors to fill a vacancy created by the death of the late Harry B. Pearson, president. L. J. Randall of Wallace, Idaho, has succeeded Mr. Pearson as president of Silver Summit Mining company. Mr. Randall is president of Hecla and Polaris Mining Companies, which control Silver Summit.

John D. Sullivan, assistant director of the Battelle Memorial Institute, Columbus, Ohio, was one of 10 receiving Awards of Merit for outstanding service from the American Society for Testing Materials. The Battelle Memorial Institute does extensive research work in the metallurgical field.

Three Utah men have received scholarships in engineering at the University of Utah from the United States Smelting, Refining and Mining Company. They are James Michael McNamara, Darrell D. Bateman and David L. Johnson.

Freeport Sulphur Company, embarked on a \$20,000,000 expansion program, has elected four new vice presidents. The new officials are Z. W. Bartlett, assistant general manager of Freeport's southern operations with offices in New Orleans; J. C. Carrington, former assistant to the president in New York; H. C. Petersen, head of the company's oil and gas division in Houston, and K. T. Price, manager of its Louisiana division with headquarters in Port Sulphur, Louisiana.

Robert F. Jaska, Charles W. Berry and Eugene W. Lingo, mining engineers, and Frank A. Kusma, mechanical engineer, have accepted positions at Oliver Iron Mining Division's operations in the Virginia-Eveleth district of Minnesota. William A. Cummins, civil engineer, is a new member of Oliver Iron's staff in the Canisteo district. James E. Seykora, civil engineer, Carlton D. Bailey, Jr., mining engineer, and Clarence E. Fin-

man, mechanical engineer, have all joined the Oliver Iron staff in the Hibbing-Chisholm district. Resignations include that of James L. Lake, metallurgist, who is now employed by the United States Vanadium Company at Grand Junction, Colorado, and that of W. P. Morris, assistant supervisor of ore beneficiation, who has accepted a position with the Combined Metals Reduction Company in Utah. Robert M. Moyle, assistant district engineer, has been transferred from Hibbing to Oliver's general mining department in the Duluth office. His successor is Milton R. Sermon.

James W. Dannini has left Howe Sound Company in Holden, Washington, to become a geologist for the U. S. Atomic Energy Commission, in Grand Junction, Colorado.

Leland H. Johnson has been named chief engineer of the ore mines and quarries division, Tennessee Coal and Iron Division, United States Steel. He has worked with Federal Mining and Smelting Company, Sunshine Mining Company, and the U. S. Bureau of Mines.

Horace Douglass Moulton is the new assistant vice president in charge of raw materials for the United States Steel Company. He formerly was vice president in charge of operations of U. S. Steel products division. He will make his headquarters in Pittsburgh, Pennsylvania.

Milton F. Rose is new mine superintendent for the Oro Flame Mining Company in the Hassayampa district near Prescott, Arizona. Mr. Rose previously worked in Superior, Arizona.

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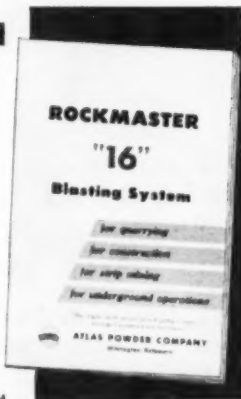


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ACTIVITIES OF INTERNATIONAL MINING MEN

D. B. SAHANA whose family has been in the business of mining mica in India for three generations. Mr. Sahana is chief mining engineer and managing director of S. K. Sahana & Sons Ltd. at Kaddarma, Bihar, India. He is also a member of the Government Mica Advisory Committee. The firm is one of India's leading producers of strategic block mica, and has recently entered into a contract with the U.S. government to supply block mica for defense and stockpiling purposes. The company is also shipping mica to several European countries.



Four Japanese smelting companies recently sent a mission to India to inspect zinc, zinc oxide, and lead markets, with an eye toward expanding Japanese sales there. Members of the mission were: **Katsuya Miyata**, deputy chief of the sales department of the Taihei Mining Company; **Izao Eguchi**, chief of industrial products section of the Kamioka Mining Company; **Kinichi Okuhara**, chief of sales department of the Toho Zinc Smelting Company, and **Ichiro Shimizu**, chief of sales department of the Japan Soda Manufacturing Company.

Robert G. Le Tourneau, American manufacturer of earth-moving machinery, is currently touring South Africa, including on his itinerary an inspection of the government-owned steel works at Queque, Southern Rhodesia. As a good-will gesture, Mr. Le Tourneau recently sent a shipload of earth-moving and lumbering machinery to Liberia to help develop the agriculture of that country.

Dr. Charles Behre, Jr., professor of economic geology at Columbia University, recently made a short reconnaissance trip to Mexico after devoting the summer to supervising geological students doing field research in New Mexico.

Benjamin N. Webber, senior geologist with the U. S. Geological Survey in Phoenix, New Mexico, is in Iraq making a three-month survey for the Technical Cooperation Administration. In addition to making a quick survey of mining possibilities and existing conditions, Mr. Webber will act as a technical advisor to the Iraqi government and will aid in the selection of young Iraq nationals to receive training in the United States.

Three distinguished Israeli visitors recently toured the plant and mine of International Minerals and Chemicals, Inc. in Carlsbad, New Mexico. They were **Dr. F. Yaron**, principal research officer, Research Council of Israel; **Dr. N. Kuhn**, Chief engineer, Israel Potash Company; and **Dr. R. Block**, director of research, Palestine Potash Company, Ltd.

John Chipman, president of the

American Society for Metals, was presented with the Luigi Losana gold medal for outstanding work in the field of science and metallurgy at the 6th national convention of the Italian Metallurgical Association, which met in Genoa, Italy last month.

Ernest Swartwelter, head of the Aetna Standard Engineering Company of Pittsburgh, Pennsylvania and his special representative, **Albert O'Connell**, are in India consulting with government officials on the possibility of erecting a large new blast furnace at Sambalpur in Orissa. If meetings with the Indian Finance Minister, **Mr. Deshmukh** are successful, **Mr. Takasaki**, president of Aetna's Japanese associate firm, will probably head a new company organized specifically for the project.

Brazilian Senator Apolonio Sales was a recent visitor to the Florida Phosphate Division of International Minerals and Chemical Corporation.



RON F. VOLLER has left Port Kembla, New South Wales, Australia, for a position as refinery senior metallurgist with Rhadesia Copper Refineries, Ltd., at Kitwe, Northern Rhodesia. For the last 18 years, he has been employed by the Electrolytic Refining and Smelting Company, Pty., Ltd., where he has had operating and research experience at the firm's copper smelter and electrolytic refinery.

Mr. Sales, a former Brazilian secretary of agriculture, was accompanied on his tour by **IM&C's** metallurgist, **Bill Bradley**, and a representative from the Tampa Chamber of Commerce, **A. R. Timberman, Jr.** Phosphate deposits were recently discovered in Brazil, and Senator Sales is inspecting phosphate mining in the United States.

Dr. Harold G. Ragatt, secretary of the Australian department of national development, recently traveled to England and the United States in connection with the development of Northern Territory's important Rum Jungle uranium deposit.

R. W. Diamond, vice president and general manager of Consolidated Mining and Smelting Company, has been promoted to the position of executive vice president western region. Mr. Diamond has been with Cominco since 1917.

M. C. P. Diskul, acting head of the Mine Inspection Section of Thailand's Department of Mines, and **C. Nilkuha**, head of the research section, are in Denver, Colorado on a five-month training period with the Bureau of Mines. They will be assigned to various Bureau stations and laboratories in this region to learn more about mineral prospecting, small mine development, mining methods, and ore-

dressing technology. The program is sponsored by the Mutual Security Agency and Point-4 technical assistance programs. Also in the United States are **Donyssios Katsaros** and **Anastasic Metaxas** representing the Ministries of Coordination and Industry at Athens, Greece.

Thomas W. Oster, chief of the Grand Junction (Colorado) exploration branch of the U.S. Atomic Energy Commission, has been transferred to Canberra, Australia, as chief of the mission which will advise and assist the Australian government in the exploration and development of uranium deposits. Also going along on the same mission are **Phillip Dodd**, **Frank Frankovich**, and **Robert K. Pitman**, geologists, all of Grand Junction, Colorado.

Neil Munro has arrived in Bombay, India to serve as managing director of **Dorr Oliver (India) Ltd.**, replacing **P. M. Constant** who is returning to the United States on leave.

Kyugiro Tsutsui, third director of the Mitsui Mining Company in Tokyo, Japan, has been making a tour of the United States, inspecting American mining methods and plants. Mr. Tsutsui, whose firm owns the largest coal mine in Japan, visited the Bingham, Utah, operations of the **Kennecott Copper Mining Company**, among others.

Tsu Ming Han, a graduate in geology of the National Northwestern University of China, will enter the University of Minnesota this fall to work for his doctor's degree. He previously received a master's degree in economic geology from the University of Cincinnati in Ohio, and was employed by the **Cleveland Cliffs Iron Company** at Ishpeming, Michigan, during the summer. Mr. Tsu plans to return to China upon completing his education.

Robert W. VanEvera, chief engineer with **Reynolds-Jamaica Mines, Ltd.**, bauxite properties in Jamaica, has returned to the United States and will be located at Crosby, Minnesota, temporarily.

H. C. BURRELL has been appointed manager of raw materials development for the **Colombia-Genova Steel Division** of the U.S. Steel Company. With headquarters in San Francisco, Mr. Burrell will travel throughout the western states



in search of raw materials for steel making. He has had extensive experience in engineering and geology. Among the positions he has held, Mr. Burrell has been a geologist with the **Cerro de Pasco Copper Corporation** in Maracocha, Peru, and with the **Zinc Corporation, Ltd.** at Broken Hill, Australia. As chief geologist for the **Oliver Iron Mining Company** in Venezuela, he was instrumental in finding the **Cerro Bolivar** iron ore deposit.



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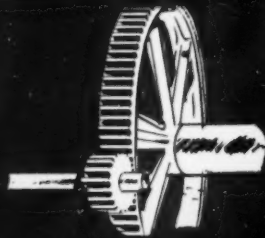
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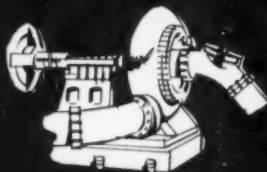
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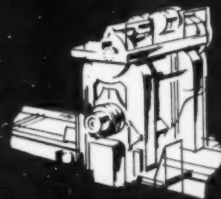
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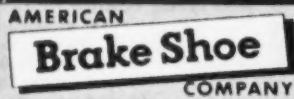
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AMSCO No. 459 for severe abrasion, mild impact. Excellent abrasion resistance. All diameters, bare and coated. Microstructure: martensitic cast iron containing chromium and molybdenum, consisting of hard carbides, austenite and martensite.

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INTERNATIONAL NEWS

More Dollar Aid To Expand Huge Austrian Iron Mine

An additional allocation of \$500,000 has been granted to the Alpine Montangesellschaft by the United States' Mutual Security Agency for further expansion of the largest iron mine in Austria. The dollar aid will finance equipment for the Erzberg and Radmer deposits in Styria, southeastern Austria.

The Erzberg is one of the principal iron ore deposits in Europe, with an estimated reserve of 350,000,000 to 500,000,000 tons. Both the Erzberg and the Radmer have produced steadily increasing amounts of iron ore as recovery has been made from the effects of World War II and Russian occupation. (Russian forces had removed most of the mining equipment during their brief occupation in 1945.)

From a low of less than 300,000 metric tons in 1945, iron ore production climbed to 979,000 tons in 1948, and 1,255,000 in 1949—still well below the average prewar output. In May 1949, \$1,976,000 was granted to the Erzberg development as a Marshall Plan project. The money was to be used to purchase necessary equipment for drilling, ore separation, crushing, and transportation, available only in the United States. The production goal was set at 1,650,000 tons annually. 1951 production surpassed that goal by 25 percent. In June of that year, an additional \$635,000 was granted for purchase of more equipment. With the increased dollar aid approved this year, a new goal of 2,400,000 tons has been set.

Japanese Government Aids Exploration at Gold Mines

The Japanese government has established a Minerals Resources Development Advisory Commission to encourage the discovery and development of mineral deposits in Japan. Both government engineers and company experts are members of the Commission. The Ore Deposits Division is the one concerned with mining.

For the fiscal year starting April 1, the Japanese Bureau of Mines allocated the funds for exploration and development. Gold mining received 80,000,000 yen, and sulphur, pyrite, copper, lead, zinc, tungsten, and other mines a total of 23,500,000 yen. The funds advanced for gold mines are for those mines which receive over 51 percent of their income from gold. Exploration for other minerals has been centered at small-and-medium-sized mines. The large base metals mines have been excluded.

Northeast Brazil To Up Hydroelectric Power

A third 60,000 kilowatt waterwheel generating unit was purchased recently for Paulo Afonso, Brazil's largest post war hydroelectric project. Delivery is scheduled for June 1954.

The 180,000-kw station, located about 90 miles inland, is the first of five projects planned by Companhia Hidro Elétrica do São Francisco to provide low-cost power for the northeast area of Brazil, which at present must import many essentials from the highly industrialized south. Previously, manufacturing enterprises in the area have installed their own power facilities.

The three generating units and other power equipment, all purchased from Westinghouse Electric International Company, will be installed in an underground powerhouse and driven by water fed through natural penstocks cut vertically in solid rock. A 2½ mile diversion dam will channel water from the São Francisco River to the penstocks for the station.

African Asbestos Property Will Be Developed by J-M

Johns-Manville Corporation will develop an asbestos property at Mashaba in the Victoria district of Southern Rhodesia. This will be the third asbestos mine under the company's jurisdiction, and is a part of Johns-Manville's long-range program to maintain adequate supplies of asbestos ore for years ahead.

The new project calls for immediate development of the properties of Rhodesian Asbestos Limited, and the construction of a small central mill to process the asbestos-bearing ore from the mine. Rhodesian Asbestos was formed in December 1951, and is under the direction of Canadian Johns-Manville, Ltd., a subsidiary of the American corporation, in association with British Metals Corporation, Ltd., Anglo-Huronian Ltd., Southern Minerals and Marketing Corporation (Pty) Ltd., and the Simon I. Patino interests.

Plant capacity and cost of the undertaking have not been revealed. James R. Ewing, formerly with Southern Minerals, has been appointed mine manager.

US and Portugal Undertake Joint Search for Minerals

The largest combined aerial and ground search for new mineral deposits ever undertaken with United States support is being undertaken in the Portuguese colonies of Angola and Mozambique in southern Africa. The United States and Portugal are sharing the cost of the undertaking, which is expected to take 2½ years to complete, and to cost nearly \$2,000,000.

The Mutual Security Agency will spend up to a maximum of \$1,300,000, representing expenses which must be paid in dollars. Portugal will pay the equivalent of \$500,000 in her own currency. In addition, Portugal will deposit about \$1,500,000 in Portuguese currency in the MSA counterpart fund account for use in carrying out the MSA defense support program in Portugal and her overseas territories.

Contracts have already been concluded with the E. J. Longyear Company of Minneapolis, and the Aero Service Corporation of Philadelphia to undertake the geological and aerial surveys, respectively.

Japanese Mines Allowed "Free Market" Gold Sales

Japan has joined the large number of countries which permit sale of newly mined gold on the "Free Market." On July 24, 1952, the Minister of Finance announced the following regulations regarding the sale of non-monetary gold: the ceiling price of gold is raised from 409 to 515 yen per gram; all newly mined gold is to be sold to the Ministry of Finance at 401 yen per gram, and the Ministry will resell the gold back to the miners at 409 yen per gram; the amount of gold to be sold back is based on 40 percent of the actual production from July to September (initial sales limited to 520 kilograms); the miners can then sell the repurchased gold at 512 yen. It is expected that the percentage eligible for premium sales will gradually be increased. Japanese production in 1951 was about 5,327 kilograms.

The new regulation of the Finance Ministry follows closely upon the signing of the Peace Treaty with the Allied Powers. The gold mining industry had advocated Free Market sales since the September 1951 decision of the International Monetary Fund to place them in line, with action subsequently taken by most of the other governments in all parts of the world.

Indian Mica Production Threatened by High Costs

The Bihar mica fields in India which supply about 80 percent of the world's requirements are said to be in danger of closing down because of high operating costs. Large wage increases, coupled with other labor concessions, numerous taxes, and high rents, leave little incentive for the mine operators to carry on. Moreover, the increased cost of imported cost of imported machinery has retarded the mechanization of mica mines in India, to the detriment of the industry.

Canadian Group to Survey Pakistan Mineral Wealth

The most extensive survey of Pakistan's mineral wealth since the birth of the state, will be carried out by a team of Canadian geological experts whose mission is financed by the Canadian government under the Colombo plan. The government of Pakistan will contribute toward the expenses of the team during its stay in the country which is expected to be about a year.

The geological survey will be carried out by means of aerial photography. About 20 members make up the team. Headquarters will be in Rawalpindi.

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Canadian Firm Expanding Lead-Zinc Copper Output

The Consolidated Mining and Smelting Company of Trail, British Columbia, is spending \$500,000 to expand its mill capacity at Tulsequah, B. C. from a 300 to 500-ton daily rate by next January.

The mines, located about 60 miles east of Juneau, Alaska, were brought into production a year ago, with their output being treated in the Polaris-Taku Mining Company, Ltd.'s concentrator. Cominco had obtained a five-year lease and modified the concentrator to treat the lead-zinc-copper ore. The lease was recently extended to eight years. Lead and zinc concentrates are being shipped to the metallurgical plants at Trail, with copper concentrates being shipped to customs smelters. Part of the gold values in the ore are recovered at Tulsequah.

The Tulsequah operation was the first of three B. C. mining properties to be brought into production under Cominco's multi-million dollar expansion program. The Bluebell Mine on Kootenay Lake at Riondel began producing in April and is currently treating 500 tons of ore per day. Construction at the H. B. Mine near Salmo is well advanced and it is expected that the 1,000-ton concentrator will start operating at the end of the year. The total cost of these mining developments was estimated to be approximately \$7,000,000.

Philippine Gold Producers Form New Organization

Banding together for the purpose of "dealing in matters peculiar to the gold producers alone," eight companies in the Philippine Islands have formed the Philippine Gold Producers Association. Through the organization, they hope to bring "urgent problems to the proper authorities for action necessary to prevent the eventual collapse of the entire gold mining industry."

Organizing companies are Baguio Gold Mining Company, Mindanao Mother Lode Mines, Inc., Surigao Consolidated Mining Company, Atok-Big Wedge Mining Company, Inc., United Paracale Mining Company, San Mauricio Mining Company, Coco Grove Mining Company, and Itogon Mining Company.

Officers elected were: H. A. Brimo of Baguio Gold, president; Alberto Guevera of Atok-Big Wedge, first vice president; T. M. Jordan of Mindanao Mother Lode, second vice president; and Nicolas Santiago, secretary-treasurer.

World Bank Loans Asked For Indian Iron, Steel

Loans for the immediate expansion of India's iron and steel production have been recommended to the International Bank for Reconstruction and Development by a mission sent to India to survey those industries by the bank. George D. Woods, chairman of the First Boston Corporation and head of the mission, said that India should be helped to construct a whole new production unit, with the ultimate aim of doubling present capacity to a total of 2,000,000 tons of finished steel yearly.

Aid has been recommended for both government and private interests. Mr.

Woods said. He also commented favorably on a decision of the Indian government to allow steel manufacturers to raise their prices by fifty rupees (\$10.50) a ton. He interpreted it as an important step toward obtaining the capital needed for expansion by private industry.

Expansion Goal Set For 1953 Bauxite Production

The Defense Production Administration has set a new production goal for bauxite. The projected annual supply for 1953 has been increased 3,300,000 long tons over the 1951 supply, raising the quota for 1953 to 8,000,000 long dry tons.

During 1951, about 60 percent of the bauxite was imported, principally from Surinam, Indonesia, and British Guiana. Total foreign imports of bauxite amounted to 2,847,000 long dry tons, while domestic production totaled approximately 1,849,000 tons. With new sources being developed in Jamaica, Haiti, and Santo Domingo, the DPA expects that by 1953 bauxite imports may supply 80 percent of the country's needs.

Canadian Firm Will Sell Cobalt to U.S. Agency

A contract for the sale of 5,000,000 pounds of cobalt has been negotiated by the U. S. General Service Administration of the Emergency Procurement Agency with the Canadian firm of Silver-Miller Mines Ltd. at Toronto. Total expenditure is reported to be around \$15,000,000.

Effective immediately, shipments will come from the company's 150-ton mill at the La Rose property. As of the first of 1953, shipments are to be made at a minimum rate of 1,000,000 pounds per year. The company will be paid for cobalt ore and concentrate f.o.b. Cobalt, Ontario, with the government agency paying the freight and treatment charges at the smelter of Deloro Smelting and Refining Company, Ltd. Silver-Miller will also be paid for all other metallic minerals contained in the ore.



PHILIPPINE ISLANDS—The infant sulphur mining industry has received a boost in its development with the signing of a contract by the *National Power Corporation* and the *Camiguin Mining Company*. Camiguin will supply 10,000 metric tons of sulphur ore to NPC beginning in March 1953. This supply will be spread over a four-year period. The corporation will use this mineral in its fertilizer plant at Maria Cristina, Mindanao. Offers of other sulphur mining firms are also being studied.

QUEENSLAND—*Mount Isa Mines, Ltd.* expects to produce copper concentrate in its new mill before Christmas. Delays have been disappointing. Construction of the reverberatory furnace is well-advanced, but blister copper is not



RICH AUSTRALIAN ZINC-LEAD MINE

Picture here are the mine headframe, differential flotation plant, machine shop, and office buildings at the Captain's Flat mine of Lake George Mines, Ltd. at Captain's Flat, New South Wales, Australia. Mining first started in the area in 1884, but large-scale operations date only from 1939 when the company built the modern mill. Through June 1952, the mill has treated over 2,000,000 tons of ore, from which 219,322 tons of lead concentrate, 318,584 tons of zinc concentrate, 30,161 tons of copper concentrate, 274,792 tons of pyrite, and 1,801 tons of gold-bearing concentrate have been recovered. Monthly ore production averages 16,000 tons from the highly mechanized mine. J. M. Ireland is general manager, and H. C. Wilkins is assistant general manager.

INTERNATIONAL

likely to be produced before March 1953.

WESTERN AUSTRALIA—*Great Western Consolidated N.L.* expects to begin treating gold-bearing ore this month, provided delivery of some Australian-made equipment is forthcoming. Output will be at the rate of 20,000 tons per month, later increasing to 30,000 tons monthly.

QUEENSLAND—*Tableland Tin-Dredging N. L.* is preparing to move its dredge (the only important tin dredge in Australia) from Return Creek to

Smith's Creek. These localities are about 160 miles southwest of Cairns on the northeast coast. The Queensland government has guaranteed a bank overdraft of A £300,000 to help finance the project.

INDONESIA—The Indonesian government's contract with *N.V. Gemeenschappelijke Mijnbouwmaatschappij Billiton*, to mine tin on the islands of Billiton and Bangka, is due to end in February 1953. Of the annual tin production from Indonesia, *Perusahaan Negara Tambang Timah Bangka* produces about 60 per-

cent, and Billiton, together with *N.V. Singkep Tin Exploitatie Maatschappij*, produces about 40 percent. (Billiton manages all three operations.) Billiton has 14 dredges working, while Bangka has 11 dredges in operation. Bangka employs 13,000 laborers on the island, while Billiton employs 8,000. Placer tin reserves are estimated at 1,237,000 cubic meters, with an average tin content of 0.57 kilograms per cubic meter. Tin production in June totaled 2,856 tons, against 2,235 tons in May. Of the June output, 2,319 tons went to Holland for treatment in the Arnhem plant, and 537 tons were sent to the United States.

PHILIPPINE ISLANDS—*Itogon Mining Company* plans to increase the daily tonnage capacity of its mill to 800 tons in the near future. This is expected to lower milling costs per ton, and to enable the company to mill ore from the lower-grade veins at a profit. The mill is presently treating 600 tons per day, with production for July exceeding 4,000 ounces of gold. Development of new ore reserves was average for the month, and unwatering of the 23 winze below the 875-foot level was started. During the past year, a three-shift crew, under the supervision of John Lingemin, opened up 1,750 feet of the 2,300-foot-level Taka drain shaft tunnel caved during World War II. The ground is so heavy that the miners have to use 6 by 8-inch spiling, and so hot that the shift changes every 20 minutes.

NEW SOUTH WALES—Tonnes from the Broken Hill mining district during July were as follows: *North Broken Hill Limited* milled 31,871 tons of ore to recover 5,277 tons of lead concentrate and 5,172 tons of zinc concentrate; *Broken Hill South Ltd.* milled 24,810 tons to recover 3,795 tons of lead and 4,554 tons of zinc; *Zinc Corporation Ltd.* milled 34,346 tons to recover 5,822 tons of lead and 6,978 tons of zinc; *New Broken Hill Consolidated* milled 16,204 tons to recover 1,555 tons of lead and 3,256 tons of zinc.

WESTERN AUSTRALIA—*Gold Mines of Kalgoorlie*, in the four-week period ending August 13, treated 13,483 tons to recover 4,249 ounces of gold. In the period preceding this, 13,299 tons were treated to recover 4,061 ounces.

PHILIPPINE ISLANDS—A mining law has been passed which gives claim owners two years of grace during which time they may reconstitute their claims where the declarations of location were lost or destroyed during the war. The same time period is given for filing for the reconstruction of other contracts and mining records. If the director does not accept them, the claimant has 30 days in which to file an appeal with the Secretary of Agriculture and Natural Resources.

VICTORIA—The gold dredge of *Harrietteville (Tronoh) Ltd.*, at Harrietteville on the Ovens River, broke its bucket-line in June and did not resume production until August. In the year ended June 28, 2,240,800 cubic yards were dredged for a recovery of only 7,163 ounces of gold. The gold yield in Victoria for the first five months of the year showed an increase of 14 percent. Production totaled 26,121 ounces of gold.

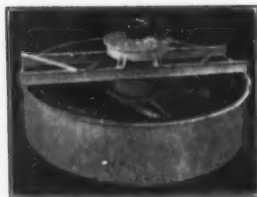
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Consolidated Zinc Corporation Ltd., will construct a new contact sulphuric acid plant at the Cockle Creek works near Newcastle. The plant is designed to burn Australian pyrite and will have a capacity of about 35,000 tons of acid per annum. The existing superphosphate plant will be modified and greatly enlarged.

AUSTRALIA—The *International Bank for Reconstruction and Development* has lent Australia \$50,000,000 to improve and expand its agricultural production and basic industries. The Australian government reportedly plans to devote about a fifth of this money to an increase in production of nonferrous metals, industrial minerals, and general industrial output. The loan will help particularly to expand production of lead and zinc, the country's major metal exports, through the purchase of mining equipment and plant machinery.

INDONESIA—The *Billiton Company* reports that tin production this year is running slightly above that of last year, but is still below the technical potential. A seven-hour working day, too low productivity, and lack of skilled personnel are blamed for hampering output. The sale of about 60 percent of production is guaranteed until March 1954, but the remaining 40 percent will depend upon world conditions and the international price of tin.

NORTHERN TERRITORY—*Peko Gold Mines (Tennant Creek) N.L.* is to be given a lease over the No. 3 Government Battery at Tennant Creek. Much interest has been evident in this company with the successful realization of its first shipment of high-grade copper ore consigned to Port Kembla, New South Wales. The Director of Mines in the Northern Territory has stated that an Australian mining and smelting company is interested in a silver-lead find made recently in the south Arnhem area.



NORTH AMERICA

ALASKA—The United States Geological Survey has reported discovery of a uranium deposit on the Seward Peninsula, about 61 miles from Siberia. Initial investigations have not shown the deposit to be commercial grade but more intensive studies may prove otherwise. The uranium is contained in *zinnerite* [$Cu(UO_2)_2(AsO_4) \cdot 10H_2O$].

BRITISH COLUMBIA—Henry L. Hill and Associates have been given a mine management contract by *Giant Mascot Mines*, second largest producer of lead concentrates in British Columbia. The mine has produced \$1,000,000 worth of lead since it started operation in February 1951. The main ore zone has been developed by drifting and diamond drilling over a vertical range of 1,000 feet. According to Mr. Hill, there is no geological reason why ore should not extend another 1,000 feet in depth which would give the mine an additional 500,000 tons of possible ore in the main zone. The expansion program started last December is now almost completed. Mill capacity has been increased from 160 tons to 450 tons per day.

OCTOBER, 1952

QUEBEC—At *Gaspé Copper Mines, Limited*, the main adit has been driven 1,000 feet and is within 400 feet of the vertical shaft location. Recent drilling has increased ore reserves to 67,000,000 tons. A contract has been placed with *The Foundation Company of Canada Limited* and construction work has begun on mine buildings, townsite, etc., while design and engineering are proceeding in connection with the proposed mill and smelter. Funds for this work are being advanced by *Noranda Mines, Limited*.

ONTARIO—Stockholders of *Central Sudbury Lead-Zinc Mines Ltd.* and its associated company, *Excelsior Mines Ltd.*, are considering granting a 99-year lease on 54 mining claims held in the Sudbury district. C. C. Houston, a mining engineer, is the interested party. He is reported to be acting for a major Canadian steel company. Under the proposed agreement, the two mining companies would receive a royalty of 15 cents a ton on all iron ore shipped or treated, and compensation for the removal of any other mineral. The lessee is primarily interested in the magnetic iron ore present in the two groups of claims involved, but it is also believed that there may be an important sulphur content in the ore.

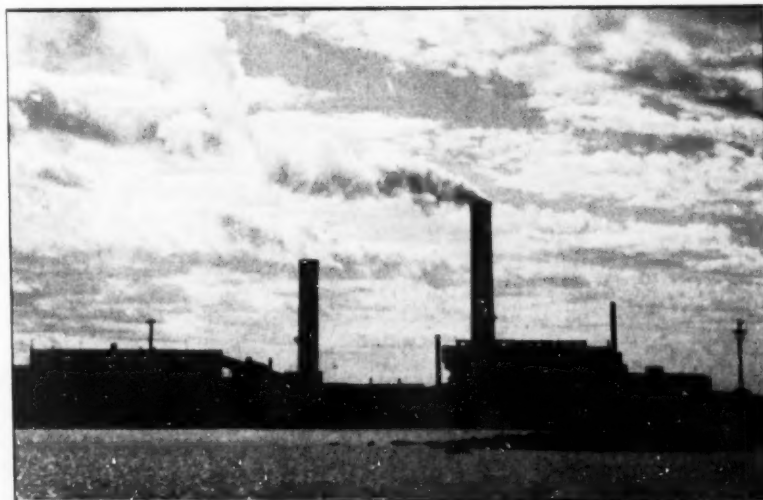
MINNESOTA—*Manganese Chemical Corporation* has signed an agreement with the *Defense Materials Procurement Agency* which should boost production of manganese. The company will build a \$2,000,000 plant near Riverton, Minnesota, with a capacity for treating at least 200 long tons of manganiferous ores daily. The DMPA will advance \$1,500,000 to be repaid with interest as the production is forthcoming. The government has also guaranteed to buy at a floor price any manganese produced under the con-

tract which does not find an American market at the time of production.

YUKON TERRITORY—*Lookout Mountain Mines Ltd.* is preparing to resume operations at its lead-zinc-silver property 20 miles north of Mayo. The mine was first discovered in 1914 and former operators drove three adits, sunk a 90-foot winze, and completed about 1,000 feet of underground work. The present company plans to rehabilitate and extend these old workings and to carry on surface exploration. Caving has made most of the workings inaccessible. J. R. Stirrett is president; C. Stillman, vice president; E. M. Flynn, director; and D. E. Cushing, secretary-treasurer and director.

SASKATCHEWAN—*Rix-Athabasca Uranium Mines Ltd.* has been assured of the continuation of its development program by the sale of 250,000 shares of company stock. The shaft collar and headframe have been completed in the Smitty Section; machinery is in its place and shaft-sinking is under way. A three-compartment shaft is planned to a depth of about 275 feet in order to explore two levels. The work in the Smitty Section is based on the results obtained from a detailed diamond drilling program earlier in the year. Shaft sinking in the Leonard Section will be undertaken at a later date.

ALASKA—The *Aluminum Company of America* plans to construct a \$400,000,000 aluminum smelting project in the Taiya Valley district near Skagway if it can obtain the necessary land and government approvals. Alcoa will have to obtain approval from both the Canadian and British Columbia governments before it can divert the waters of the Yukon River needed for the generation of cheap hydroelectric power. Special arrangements will also have to be made with the United



National Film Board

HUDSON BAY ZINC FUMING PLANT

A view of the Hudson Bay Mining and Smelting Company Limited's smelter at Flin Flon, Manitoba, Canada. Last year, the company built a slag fuming plant adjacent to the existing smelter to process hot slag from lead furnace operations, and cold slag from the 937,000-ton stockpile. This stockpile reportedly averages 26.6 percent zinc, 1.13 percent copper, 0.151 ounce gold, and 3.96 ounces silver per ton. The plant is designed to treat 109,000 tons annually, of which 51,000 tons of hot slag will come from current production. The company plans to reduce the amount of new ore mined and milled to 1,460,000 tons per year, with the residue from the zinc plant supplying the difference to maintain normal zinc production.

{World Mining Section—43}

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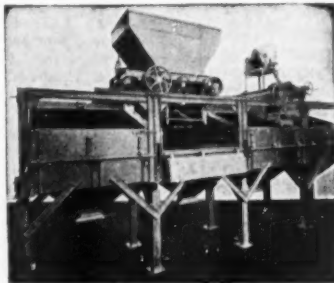
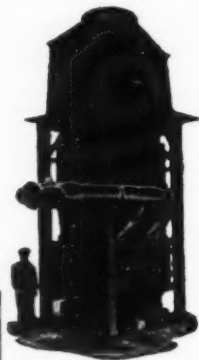


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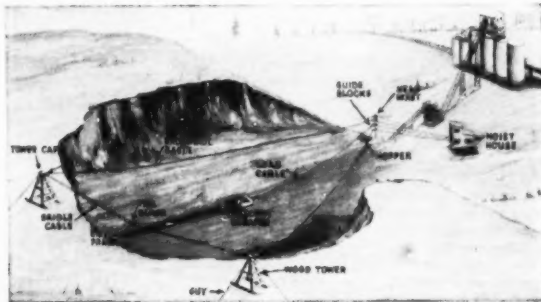
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INTERNATIONAL

States government for the purchase of about 20,000 acres of government land. Under the present law, this land can be purchased for commercial enterprises in amounts not to exceed 160 acres. Talks are now being held with officials of the Department of the Interior. The proposed project would be capable of producing 200,000 tons of aluminum annually. It would take four years to complete and would be privately financed.

QUEBEC—*Parco Drilling & Exploration Company* of Quebec City plans to begin diamond drilling on its 2,000-acre property in Panet Township which it currently holds under working option. First drilling will be done on the north-east section where surface showings of base metals have been encountered. At the same time, surface prospecting will be conducted on the southern part of the property. *Eastern Metals Corporation* property adjoins Parco's on the east.

NEVADA—*Tonopah Development Company* has exposed an orebody of undetermined magnitude at the *Summit King* mine north of Tonopah, Nevada. Assays are said to indicate a value higher than \$50.00 per ton, with a ratio of 100 parts of silver to one part of gold. Additional development work will have to be done before possibilities are known. Operations are being conducted by *Tonopah Development* which is comprised of the *Summit King Mines, Ltd.* and the *Home-stake Mining Company*. The company began to prospect the area last December, under lease from *Calumet & Hecla Consolidated Copper Company* which owns the property.

BRITISH COLUMBIA—The *United States Smelting, Refining and Mining Company* of Boston, Massachusetts, has been registered in British Columbia recently to carry on exploration and development of natural resources.

SASKATCHEWAN—The first uranium rush in history got under way in August along the north shore of Lake Athabaska. Officials of the Saskatchewan Department of Natural Resources estimate that about 1,000 prospectors will have filed claims before the first rush is over.

WASHINGTON, D.C.—A new glass fiber has been developed as insulating material, which should help to alleviate the shortage of asbestos fiber necessary for much insulating cloth. In the new product, each strand of yarn is composed of staple glass fiber mixed with asbestos fiber. According to Ray Coultrap, chief of the *National Production Authority's* Asbestos and Fibrous Glass Section, "while the over-all supply of spinning fiber from Canada is being maintained at a steady pace, a decrease in the supply of crude fiber is to be expected as a result from the changing in mine operations from open pit to block caving or underground mining in which there is less hand cutting of fiber."

BRITISH COLUMBIA—The 125-ton mill built by *Cody-Reco Mines Ltd.* at its lead-zinc-silver property in the Sloean mining district is in operation and performing satisfactorily. Installation of a supplementary sink-float unit is still under construction. Mill feed is presently coming from dumps near the portals of the old mine workings. Preparations are being made for production from the underground workings. A 2,800-foot tram-

line has been erected and a road has been built from the mill site up the mountain to the mine.

ALASKA—Two tin placer firms are at work in the Cape Wales area near Nome. *The Zenda Gold Mining Company* which has leased the Peterson property on Cape Creek is doing exploratory work with the aid of a \$60,000 DMEA contract. Norman C. Stines is the engineer in charge. The firm has reportedly applied for a \$490,000 DMA loan to cover the cost of moving in dredging equipment to dredge a newly discovered channel estimated to contain 500 tons of tin. The Ramstead Brothers, operating as the *Northern Tin Corporation*, are carrying on placer operations on Buck Creek. They have no government loan.

ONTARIO—Production has started from the *Matarow Lead Mines Limited* in the Matachewan area. Regular shipments of 200 tons of ore per day are being made to the mill of *Matachewan Consolidated*, four miles away. The firm hopes eventually to increase shipments to 300 tons per day. *Matachewan Consolidated* invested \$65,000 in the development of the Matarow. *Matachewan's* mill was divided so that Matarow ore could be milled there, and treatment of its own gold ore was limited to 300 tons daily. The flotation section is being used to produce lead and zinc concentrates, so the gold ore will now be treated by the standard cyanidation method.

QUEBEC—*Aluminum Limited* reports that its extensive construction work is

generally on schedule. The first of 10 new generating units on the Peribonka River in the Saguenay district have started, and the new smelter at Isle Maligne is in production. Its full annual capacity of 50,000 tons should be reached shortly. On the British Columbia project, the hydroelectric project, including the 10-mile tunnel through the mountain, is well advanced, and in Jamaica the first stages of bauxite mining and alumina manufacture will start production this month. The first important bauxite shipments from the new French Guinea development in West Africa are expected this fall.



BOLIVIA—The production of tin and other metals is continuing at a slackening pace while awaiting definite word about nationalization of the mines. Many foreign technicians have either left or are planning to leave the country. The present price of tin is reported to be uncertain, with the prices of lead, zinc, and antimony dropping. The government's one attempt at running the mines is said to have been unsatisfactory. This is the *San Jose* mine (tin, lead, and silver) which is being operated under the supervision of the government by the

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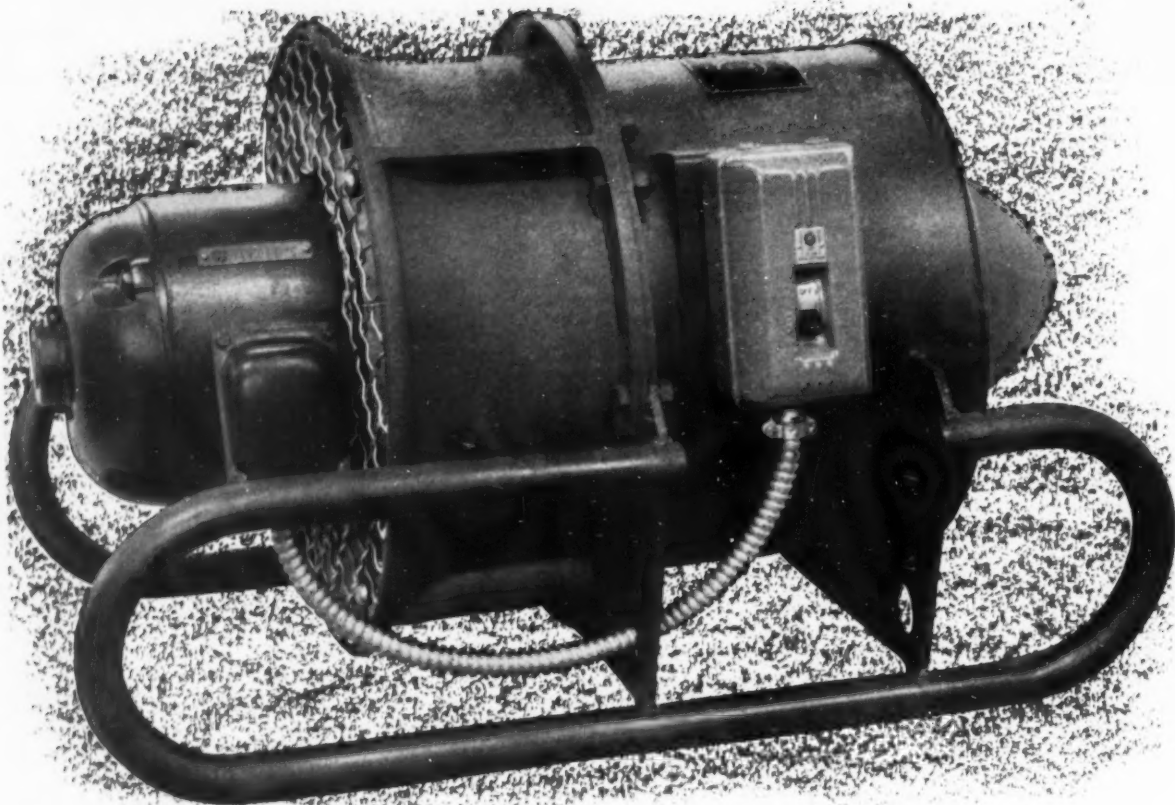
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Africa: Accra, Gold Coast; Costermansville, Belgian Congo; Johannesburg, Union of South Africa; and Kilwe, Northern Rhodesia. **Asia:** Ankara, Turkey; Benares, India; Kuala Lumpur, Federated Malay States; and Tokyo, Japan. **Europe:** Frankfurt, West Germany; Helsinki, Finland; London, England; Madrid, Spain; Paris, France; Redruth, Cornwall; Rome, Italy; Stockholm, Sweden; The Hague, Netherlands; and Trondheim, Norway. **North and Central America:** Mexico City, Mexico; San Jose, Costa Rica; and Vancouver, British Columbia. **Oceania:** Port Kembla, (N.S.W.), Australia. **South America:** Bernal, Argentina; La Paz, Bolivia; Lima, Peru; Quito, Ecuador; and Sao Paulo, Brazil.

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate section on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

Banco Minero de Bolivia. The owners receive a royalty. There appears to be much doubt about whether the government can actually run the mines any better or at a higher profit than the present owners do.

SURINAM—Sarakreek Goldfields has reported a profit of 90,733 florins for 1951. Gold production during that year totaled 106 kilograms, against 91 kilograms in the previous year. The company's kyanite deposit is still being subjected to metallurgical testing and commercial sales research.

MEXICO—Sulphur shipments from the mines of *Neg. Minera, S.A.* at Cerritos, San Luis Potosi, are to be speeded up by the addition of aviation facilities. The company, in conjunction with the state government, is building an airport at Cerritos. These mines, and the plant of *Petroleos Mexicanos*, the official oil company, in the Poza Rico oil fields of Vera Cruz, are at present Mexico's principal sources of sulphur.

BOLIVIA—A special decree has been published which announces that dollar salaries can only be paid by special authorization. A list has been posted which specifies the amounts that may be paid to particular mining men whose wage contracts were in effect before June 2, 1952. The monthly salary in dollars is listed for the top personnel of the *Empresa Minera Mauricio Hochschild S.A.M.I.*, *Oficina Central de Minas*, the *Compania Huanchaca de Bolivia, Cia. Minera de Oruro*, *Seccion Colquiri y Morococala*, *Compania Minera Unificada del Cerro de Potosi*, *Mina Bolsa Negra*,

and *Empresa Bolivian Tin Corporation*. These men must submit their foreign papers, titles, and certificates of technical qualification before receiving their payment. The *Banco Central* will redeem currency at the rate of 100 bolivianos for every U.S. dollar. The free market rate is 250 bolivianos for every U.S. dollar.

COLOMBIA—For the first half of 1952, *Pato Consolidated Gold Dredging, Ltd.* dredged 9,512,400 cubic yards to recover 94,074 ounces of fine gold. *Nechi Consolidated Gold Dredging Ltd.* dredged 2,401,000 yards to recover 6,624 ounces of fine gold. *Asnazu Gold Dredging, Ltd.* dredged 3,170,800 yards to recover 9,800 ounces of fine gold.

BOLIVIA—The Bolivian miner, on the average, is high in morale and one of the best workers to be found in the mining industry, according to Angelo De Tuddo, sociologist in the Bolivian Ministry of Labor and Social Provision.

Speaking in late June, De Tuddo revealed that a commission appointed by the above Ministry, and also for the Ministry of Mines and Petroleum, had just completed a survey trip through the large-scale mining industries of the country to study social aspects. In the course of this project they visited the homes of miners, the mines, and other facilities of the mining companies, schools, hospitals, etc.



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"From a general point of view," declared De Tuddo, "the workers are provided with reasonable sanitation facilities and a social organization constituting a satisfactory basis for their lives." However, he stated, the commission found that in some districts, housing was inadequate, and some lack of other necessary facilities also was encountered. The commission has submitted a report on the subject to the government.

MEXICO—Now that several mining companies are cooperating with the Federal and State governments in building roads to remote mining areas, the Federal government plans to provide electricity in these zones which either lack it entirely or have inadequate facilities. The plans are in the hands of the Ministry of Finance and the Federal Electricity Commission. The Mining Chamber has asked the Ministry to aid some of its members in building other roads by allowing them a reduction in production taxes for that construction. The Chamber estimates that members thus aided would be able to retrieve their investment in five years, because better transportation would make increased production possible.



EUROPE

EASTERN GERMANY—The output of copper ore from the *Mansfeld* mines is said to have amounted to 1,012,000 metric tons in 1951. This is a considerable increase over production of 698,000 metric tons in 1949, and 803,000 metric tons in 1950. Production has almost returned to the 1937 level of 1,250,000 tons. Roughly estimated, about 25,000 tons of blister copper may have been extracted from this ore in 1951. According to the revised Production Plan for the Eastern Zone, 2,650,000 tons of ore will be mined in 1955.

BRITISH ISLES—Llanrwst Lead Mines Ltd. is nearing completion of its new concentrator which is being erected at its property in North Wales. The ore will be ground in ball mills to 80 mesh and treated by selective flotation using a rougher-scavenger-cleaner circuit on the lead flotation. The lead tailing will be reground to 120 mesh; it will then go to a thickener where the overflow, carrying certain reagents, will be discarded, and the underflow will be conditioned for additional treatment in a zinc flotation circuit. The mines in the Llanrwst district have been worked intermittently for many years. In 1951, Llanrwst Lead Mines, Ltd. was formed under the auspices of *Johannesburg Consolidated Investment Company* to acquire the *Parc* and a number of adjacent mines.

SWEDEN—During the first half of 1952, Sweden exported 7,139,000 tons of iron ore, compared with 6,041,000 tons during the same period in 1951. The value of the shipments was 337,400,000 crowns and 214,600,000 crowns, respectively. The average price per ton rose from 35 crowns to nearly 53 crowns during that period. The price is still rising; in June 1952 it was 61 crowns, while in June 1951 it was 34 crowns.

CZECHOSLOVAKIA—The "People's Republic" expects 26 major mines to be in operation in 1953. Four of these will

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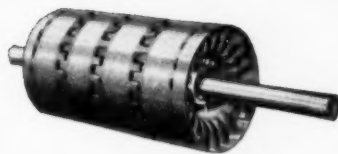
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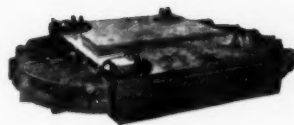
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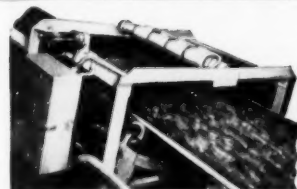


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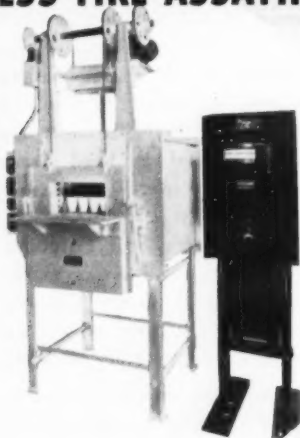
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1952

be new, 16 mines will be expanded, and work in six mines will be resumed. Two large deposits have been found within the country. One is located in the Jesenece Mountains in the Bohemian-Moravian Highlands; the other was found in the Slovakian Rudhori Mountains, in the region of Spis and Gemer. Plans call for the construction of seven iron ore agglomeration plants by 1955.

WESTERN GERMANY—Mine and smelter monthly output during the first half of 1952, averaged as follows: From the mines—lead, 4,116 metric tons; zinc, 6,419 metric tons; copper, 175; pyrite, 47,137; iron ore, 1,199,000; potash, 1,023,000. From the smelters—aluminum, 7,550 metric tons; lead, 11,296 metric tons; copper (refined), 15,452; zinc, 12,952.

EASTERN GERMANY—Iron ore production in 1951 totaled 489,000 metric tons. In 1950 the tonnage was 401,000, and it is planned that in 1955 this will be increased to 3,650,000 metric tons. Pyrite produced in eastern Germany during 1951 amounted to 98,320 metric tons. In 1950, pyrite production totaled 91,040, while in 1955 the planned output will be 122,000 metric tons.

YUGOSLAVIA—The *Dabrica* bauxite mines near Stolac in southeastern Herzegovina have started production and they are currently running at the rate of 300 tons per day. This will be increased at a later date. The deposits are being mined by open-pit methods. Estimated reserves are fixed at about 300,000 tons. The country is expected to export about 270,000 tons this year, with production coming from *Dabrica*, and mines at *Citluk* and *Crne Lokve*.

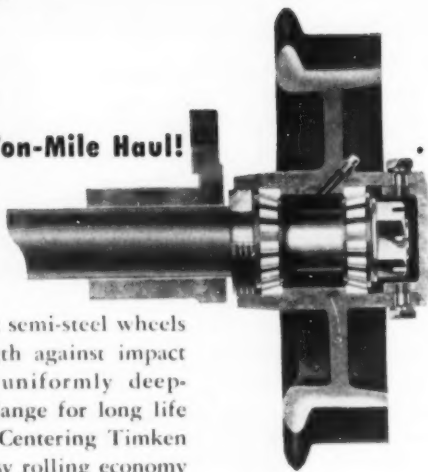
NORWAY—Production of pyrite in 1952 is expected to total about 700,000 metric tons. This should be increased next year when the *Skorovas* mine in North Trondelag is expected to be producing at the rate of 150,000 to 200,000 tons annually. Some exploration work is being done at deposits near the *Vaddas* mine in North Troms.

AUSTRIA—According to the Austrian Ministry for Nationalized Industries, the country will be able to meet all domestic demands for lead by 1954, and will be in the same position for zinc by 1955. The improvement is said to be due to the extension of operations at the *Bleiberger Bergwerks Union*. No importing of antimony is anticipated for this year, and some may be exported.

NORWAY—The reconstruction of the important *Biørnevann* mine and processing plant of the *Sulvaranger Iron Ore Company* in northern Norway was made possible by some \$3,000,000 worth of mining and processing equipment, machinery, and transport vehicles from the United States financed under the Marshall Plan and the Mutual Security program. The mine and its plants which were completely destroyed by the Nazis in 1944 are now back in production and are expected to turn out 1,000,000 tons of iron ore concentrates annually by next year. Mining operations were resumed in the spring and the company expects to mine more than 1,000,000 tons of ore this year. Processing in the firm's beneficiation plants will result in production of 500,000 tons of 66 percent concentrates by the end of the year. These concentrates are expected to have an estimated value of about \$6,500,000 or approximately twice the dollar amount thus far "invested" in the project by the ECA and MSA.

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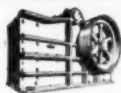
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[World Mining Section—51]

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INTERNATIONAL



AFRICA

UGANDA—An agreement has been reached by the *Rio Tinto Company*, *Monsanto Chemicals*, *Frobisher Ltd.*, and the *Uganda Development Corporation* to form a new company called the *Tororo Exploration Company* to explore the mineral wealth in the Sukulu district. The governor of the Protectorate will grant Tororo a special exclusive prospecting

license for pyrochlore ($\text{NaCaCb}_2\text{O}_6\text{F}$), magnetite, apatite, francalite, baddleyite, and zircon. For the past two years, a government survey has been conducted over the area which has established the existence of the minerals in considerable quantity. A pilot plant will be established to work on problems of ore separation and dressing involved in the project. If all goes well, a mining company will be formed by the same group to mine and process the minerals on a large scale.

SOUTH AFRICA—The July tonnage mined and milled by *Welkom Gold Mining Company Ltd.* was decreased somewhat by the heavy inrush of water at the No. 1 shaft. The water was soon under control and normal operation was resumed

within two days but the delay affected production to some extent.

ANGOLA—According to reports from Lisbon, the profit on diamonds produced by the *Companhia de Diamantes of Angola* in 1951 was £1,406,855. In the last 30 years, the government of Angola has been paid £8,548,912 by the company.

GOLD COAST—Production by the Gold Coast African diamond industry during the month of June was 120,842 carats, which was 25,223 carats less than in May. At the end of the month, the price per carat was about 50s which was a slight increase over the May price. Total production for the first half of 1952 was 790,969 carats. During June, 26 digging licenses were issued making a total of 658 for the year, to date. Eight licenses were revoked for breaches of regulations during the month.

SOUTH AFRICA—Production reportedly will start soon from a new tin mine in the Pretoria district. The mine, called the *Zustershoek*, is 47 miles from Pretoria and 23 miles northeast of the *Premier* diamond mine. The existing plant is now being enlarged to treat 60 to 70 tons of ore per day, with an estimated tin content of between two and four percent. Prospecting of the area has been going on for the last three years, and a number of veins carrying two to 10 percent tin are said to have been exposed.

NIGERIA—*Ex-Lands Nigeria Limited* reports that in 1951 tin output of 610 tons was 102 tons less than in 1950, which meant £70,000 less revenue. Costs, on the other hand, increased by £47 per ton, or over £11,000. Realization and royalties took another £32,500. Under these circumstances, it was necessary to improve efficiency and to "effect closer liaison with associated companies in Nigeria." During the first five months of the current year, 250 tons were produced which was 13 tons less than the same period of 1951. However, a policy of mechanization wherever possible is being applied, and a new Monighan walking dragline is being erected. Both should help to improve production.

SOUTH AFRICA—*Dominion Iron and Steel Corporation Ltd.* is making progress toward production from its deposits at Airlie in the Eastern Transvaal. The first Krupp-Renn rotary furnace and auxiliary equipment ordered in December 1951 were shipped in June 1952. The balance of the Krupp-Renn machinery will be delivered by the end of the year. The company says that similar plant orders placed today could not be delivered in less than 18 to 24 months. All survey work at Airlie for the railroad siding, roads, and plant site has been completed. Preliminary work has been started on the plant foundations. Development operations are also under way on the iron ore deposits, which are expected to produce about 150,000 tons of iron ore per annum.

SOUTHERN RHODESIA—*Magundi Chrome Mines Ltd.* has applied for a listing on the Johannesburg Stock Exchange. The company was incorporated last year. Its property consists of 43 base metal blocks of ground, interspersed with claims of *African Chrome Mines, Ltd.* and *Rhodesian Vanadium Corporation* in the Lomagundi district. The seams of chrome ore in the area have been developed by surface workings. In many instances they appear to have a considerable strike length but have only been developed

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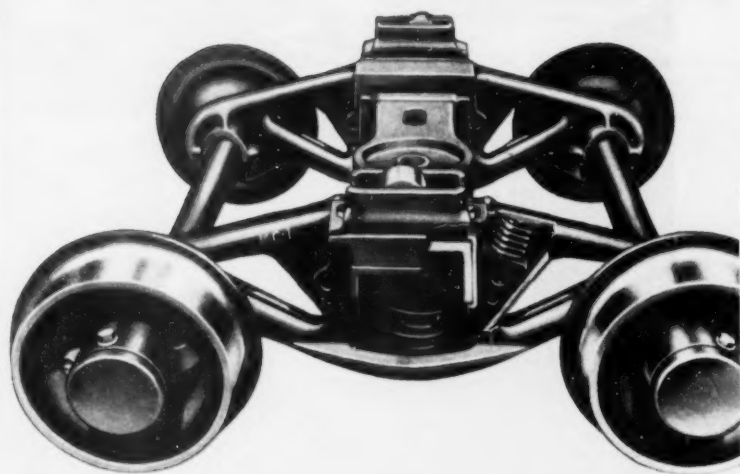
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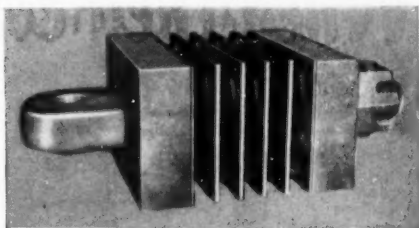
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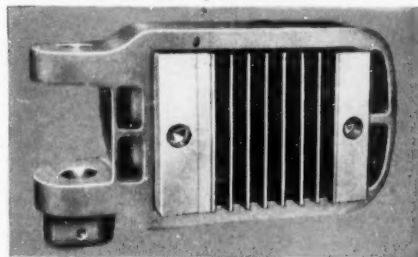
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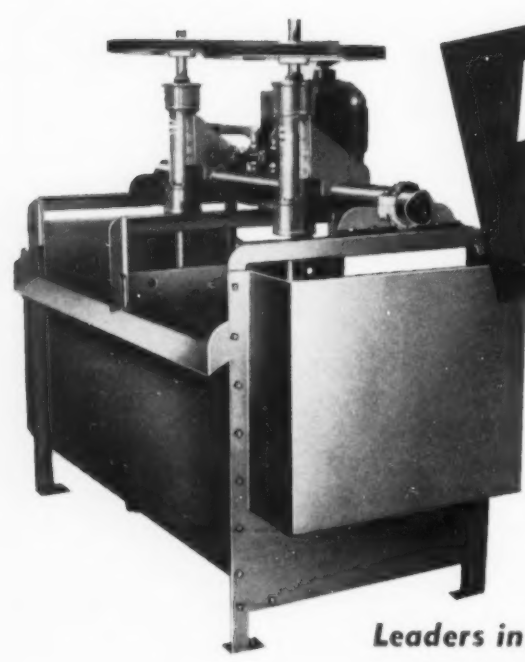
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INTERNATIONAL

where they crop out. In other places on their strike, the seams are believed to exist but to have been covered by overburden eroded from the hills comprising the Great Dyke. Further prospecting is therefore necessary.

NIGERIA—*Bisichi Tin (Nigeria) Ltd.* reports that production of both tin and columbite showed satisfactory increases in 1951 over the previous year. In 1951, 672 tons of tin and 166 tons of columbite were produced, compared with 450 tons and 130 tons respectively in 1950. The price of tin averaged £956 per ton which was £98 lower than in 1950. Columbite sold for £1,384 per ton, which was higher than in 1950 by £740 per ton. Output for the current year (to the end of May) was 279 tons of tin and 78 tons of columbite. Some 42½ tons of columbite were reclaimed from dumps and treated; a considerable quantity of dump material still remains to be treated.

GOLD COAST—In its annual report, *Amalgamated Blanket Areas, Ltd.* states that for the third successive year a record tonnage of ore was mined and milled. Total output for the year was 656,545 tons, showing an increase of 118,855 tons over the previous year, with a gold recovery of 93,749 ounces. Developments in the *Abbontiakoon* mine and in the *Fanti* section are meeting with success. The aerial tramway linking the *Tamsoo* mine with the central mill has been completed and a steady flow of ore is being sent from *Tamsoo* for treatment. Reasonable progress has been made with the *Fanti* tramway; however, delays in steel deliveries are affecting the completion date, which is now expected by the spring of 1953, approximately six months behind schedule.

ORANGE FREE STATE—*Harmony Gold Mining Company, Ltd.* reports that the Basal Reef has been stoped out for 15 feet around the ventilation shaft to facilitate the removal of the shaft pillar at a later date. The face of the stoped-out area has been sampled at five-foot intervals, the average undiscounted assay value of 35 sections being 15.4 dwt. per ton over a channel width of 45.6 inches, equivalent to 702 inch-dwt. Work is now proceeding on the completion and equipment of the shaft and it is not expected that there will be any further development on reef until early next year.

CAMEROONS—*Mayo Darlé* is the only cassiterite deposit in operation in the Cameroons. It was discovered in 1927 and has been worked since 1933. As of December 31, 1951, 4,362 tons of cassiterite concentrates at 70 percent tin had been extracted. Production, which had been maintained at about 325 tons annually until 1943, was lowered considerably after World War II. It totalled only 103 tons for 1951. The production drop resulted from the progressive exhaustion of the alluvial deposits at *Mayo Darlé*, and the development of other alluvial areas not as rich. The *Societe les Etains du Cameroun*, which operates *Mayo Darlé*, has a General Exploration Permit Class "A" for some 24,000 square kilometers in West Cameroon where exploration is now underway. The Bureau Minier is also prospecting with an equally large General Permit in the *Ngaoundere*.

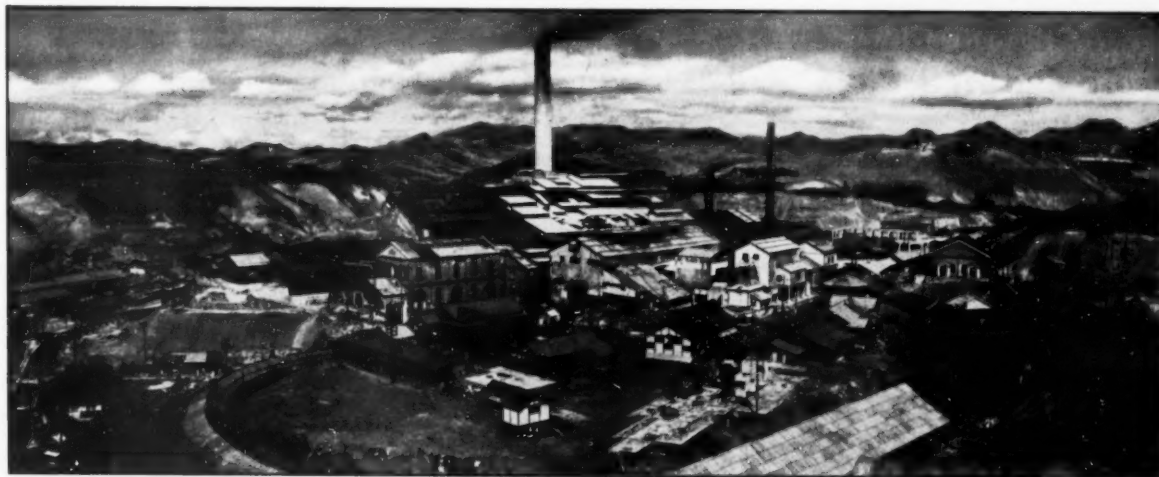
FRENCH WEST AFRICA—In exploring for copper in the *Akjoit* region, 13 borings have been made to a total depth of 1,500 meters. The presence of sulphide ore has been indicated. Proven reserves of copper are estimated at more

than 200,000 tons. However, commercial development is not yet anticipated. The ore is said to contain 30 percent copper, and reportedly could produce some 10,000 tons per year. Prospecting is under the direction of the French Direction des Mines.

WEST AFRICA—*Harry Winston, Inc.*, a New York diamond dealer, is reported to be negotiating for the right to distribute the output of rough diamonds from Portugal's West African mines. It is rumored that if an agreement is reached, a diamond cutting and processing industry may be established in Portugal. A contract with the *DeBeers* diamond syndicate does not expire until 1955. Mr. Winston was one of the gem dealers who attempted to reach an agreement with Dr. John T. Williamson of Tanganyika, several months ago. Portuguese West Africa's diamonds are produced by the *Angola Diamond Company*. Output is estimated at 734,300 carats annually, or about 8 percent of the world supply.



PAKISTAN—The Commerce Ministry is reported to be considering a proposal which would make it compulsory for foreign firms operating in Pakistan to employ at least 50 percent Pakistanis on their supervisory staffs. A preliminary questionnaire may be sent out to the firms concerned, requesting information on their present organization. If the leg-



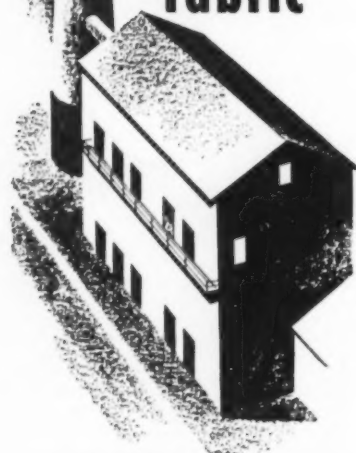
FLUOSOLIDS ROASTER AT JAPAN'S KOSAKA COPPER SMELTER

The Dowa Mining Company is installing the first Fluosolids roasting plant in Japan at its Kosaka copper smelter in Akita prefecture, North Honshu (pictured above). Installation of the roaster is under contract to the Darr Company with completion scheduled for November. The installation is based on successful pilot plant testing of "Kurako" type ore containing chalcopyrite from the company's Hanaoka mine which assays 1.68 percent lead, 7.56 percent zinc, 3.40 percent copper, and a large amount of barium sulphate. This ore has been concentrated by flotation, but separation of the copper and zinc was not too successful. The copper was recovered in a blast furnace, but the zinc was lost in the slag. When the new roaster

(with a capacity of 80 tons per day) is in operation, it is anticipated that 95 percent of the copper can be recovered as copper sulphate, 90 percent of the zinc as zinc sulphate, and 50 percent of the iron converted to ferric sulphate. At this time, the roaster gas will not be used as a source of sulphur for a sulphuric acid plant. It is estimated that smelting costs will be reduced 10 percent by the new equipment. The company was granted a loan of 350,000,000 yen by the government's Development Finance Bank to finance the project. Hidesaburo Kurushima, Showa president, spent six months in the United States in 1950 and 1951 investigating the process and observing metallurgical testing of the ore.

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isolation is approved, it will cause serious upheaval in certain firms.

JAPAN—With the increasing demand for quicksilver, several mines in Japan have resumed operation. *Itomuka*, one of the leading quicksilver mines, is developing deeper underground workings. Located in Hokkaido and owned by the *Nomura Mining Company*, it was proved last year that 30,000 tons of recoverable ore exist in ore veins No. 4 and No. 5. Another deposit (No. 6) has since been located with an estimated 60,000 to 70,000 tons of recoverable ore, averaging 10 percent mercury. Production of quicksilver from the mine during August was estimated at about 10 tons. The production in 1951 (April 1951 to March 1952) was 25,878 tons of crude ore assaying 0.33 percent (approximately 86 tons of quicksilver). Production in 1952, however, is expected to be about 37,500 tons of crude ore averaging 0.35 percent (130 tons).

INDIA—The Indian government, which limits the return that the steel-makers receive for their products and subsidiary foreign imports, has decided that higher selling prices are required. As of July 1, sales prices were raised by 50 rupees per ton, and the retention price allowed to the *Mysore Iron and Steel Works* by 53 rupees per ton. The two principal producers, *Tata Iron and Steel Company* and the *Steel Corporation of Bengal*, will continue to receive the present retention prices until such time as future policy is decided; in view of the need to expand the output of iron and steel in India, their retention prices will probably be raised in the near future.

CYPRUS—*Cyprus Sulphur and Copper Corporation*, controlled by the *Esperanza Copper and Sulphur Company*, reports that the main adit at Kinoussa is now within a few feet of the No. 1 shaft, and that stope preparation is well-advanced. Recent work in this section has enabled the general manager to give a new estimate of the high-grade copper-sulphur-zinc ore available between levels 1 and 2. He estimates it at 275,000 tons, an increase of 35,000 tons over previous estimates.

JAPAN—*Republic Chemical (Japan), Ltd.*, a subsidiary of the New York firm, has placed its new selenium plant in operation. The 99-percent selenium produced at the plant is in powder form. The plant is operating on a backlog of orders and its production is said to be allocated by countries and customers. Selenium, a rare metal, is used in radar, television, and electrical equipment. In the United States, it is under the control of the National Production Authority.

MALAYA—*Pacific Tin Consolidated Corporation* reports that for the second quarter of 1952 the net income after taxes, and before depreciation and depletion, was \$474,000, compared with \$253,000 during the same period in 1951. For the first six months, corresponding figures were \$1,061,000 and \$702,000, respectively. The company operates dredges in the states of Perak and Selangor. Armed Communist guerrillas recently attacked the Pacific Tin dredging settlement in Perak, damaging the huge dredge and wounding a number of employees. These operations constitute the major program of Pacific Tin in Malaya. The damaged dredge is one of the world's largest tin dredges and most heavily powered of all Malayan placer mining dredges.

INDIA—For the first time, India will produce electrolytic copper—as a by-

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product of a new process just adopted for the proposed 10,000,000 rupee silver refinery at Calcutta. G. C. Miter, chief metallurgist for the new refinery, together with the German firm of Demag Electro-Metallurgic GmbH, developed the improved method for refining silver. Work on the new refinery is expected to be completed within 18 months. It will extract silver and copper from the quarternary coins introduced during the war and now being replaced by nickel coins.

JAPAN—The Japan Steel Tube Company (*Nihon Kokan*) sent a four-man mission to the Philippine Islands for business talks about the construction of a steel rolling mill. They also inspected iron ore resources in the Islands. Shinzo Tanaka, deputy chief of the company's sales department, is in charge of the mission.

MALAYA—The *Quarterly Bulletin* of mining statistics reports that during the first half of 1952, the production of tin concentrates totaled 246 tons more than that in the same period of 1951. This lead over last year may be lost during the second half of 1952, because of the closing down of some dredges for repair and re-erection; however, the decrease from this cause may be offset by the increase in production from gravel-pump mines which continues despite a decline in the number of mines still operating.

INDIA—A six-year plan of the *Tata Iron and Steel Company* is expected to step up production capacity of the company's steel works at Jamshedpur from the present level of 750,000 tons to 930,000 lakh tons by 1956-57. Estimated to cost 35,000,000 rupees, the plan is to replace worn-out and obsolete plants, and to improve and modernize other plants.

JAPAN—*Yamahara* mine, located in Okayama prefecture, the highest-grade pyrite property owned by the *Douca Mining Company*, completed the expansion work needed to produce 4,000 tons per month of pyrite containing 40 per cent sulphur, and is now in operation. The existence of an additional 6,000,000 tons of recoverable pyrite ore has been confirmed in an area adjoining the Yamahara orebody. The company is now developing and equipping the new deposit. When completed in March 1954, the monthly output is scheduled to be 43,500 tons of 40 per cent sulphur pyrite, 3,000 tons of a lower grade pyrite, and 3,500 tons of pyrrhotite. An additional 10,000 tons of chalcopyrite will be produced from another deposit.

THAILAND—*Tromoh Mines, Ltd.*, through its wholly owned subsidiary, *Tin Lay, Ltd.*, and through its interest in *Tromal Prospecting Ltd.*, is testing the possibility of dredging farther off shore in the strait between Phuket and the mainland. Dredges have been operating for some time off shore in Tongkah Harbor on the Island of Phuket. If the new project is successful, there may be development of other off-shore deposits along the coast of Thailand.

MALAYA—*Kinta Tin Mines* reportedly had to close down its *Perak* property for a short time due to an interruption of water supplies caused by the terrorist activities.

INDIA—Recent investigations by the Geological Survey have shown the presence of about 100,000 tons of bauxite in the districts of Mandla, Durg, and Balaghat in Madhya Pradesh. In the Amarkantak area of the Shahdol district of Vindhya Pradesh, the presence of 570,000 tons of ore has been located.

U.S. METAL & MINERAL MARKETS

METALS

SEPTEMBER 15, 1952

COPPER:	Electrolytic. Delivered F.o.b. cars, destination U.S.A.	24.50¢
	Lake. Delivered, destinations U.S.A.	24.625¢-27.50¢
	Foreign Copper. New York	36.00-36.50¢
LEAD:	Common Grade. New York	16.00¢
	Tri-State Concentrates, jig, flotation 80% lead, per ton ...	\$202.95
ZINC:	Prime Western. East St. Louis	14.50¢
	Tri-State Concentrate, 60% zinc, per ton	\$96.00
ALUMINIUM:	Primary 30 pound Ingots (99% plus). F.o.b. shipping points	20.00¢
ANTIMONY:	Lone Star Brand. F.o.b. Laredo, in bulk	39.50¢
BISMUTH:	(In ton lots) price per pound	\$2.25
CADMIUM:	Sticks and bars. 1 to 5 ton lots (Price per pound)	\$2.00
COBALT:	97-99%, keg of 550 pounds (Price per pound)	\$2.40
MAGNESIUM:	Ingots (99.8%). F.o.b. Freeport, Texas	24.50¢
MERCURY:	Flasks. Large lots, New York	\$187.00
NICKEL:	"F" Ingots (5 pounds). F.o.b. refinery, Port Colborne, Ontario	56.50¢
TIN:	Grade A Brands. New York (Price per pound)	121.50¢
TITANIUM:	99.3% + (Price per pound)	\$5.00-7.00
GOLD:	United States Treasury price	\$35.00 per ounce
SILVER:	Newly mined domestic. United States Treasury price	90 1/2¢ per ounce
	Foreign. Handy & Harman	83.25¢ per ounce
PLATINUM:	\$93.00 per ounce

ORES AND CONCENTRATES

BERYLLIUM ORE:	10 to 12% BeO. F.o.b. mine, Colorado	\$36.00 per unit
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesian). 48% Cr ₂ O ₃	\$45.00-\$48.00
	African (Transvaal). 48% Cr ₂ O ₃	\$34.00-\$35.00
	Turkish. 48% Cr ₂ O ₃ . 3 to 1 chrome-iron ratio	\$53.00-\$54.00
	U. S. Government ore purchase depot Grants Pass, Oregon, Base price, lumpy ore, \$115.00; fines and concentrates \$110.00 for 48% Cr ₂ O ₃ and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr ₂ O ₃ .	
IRON ORE:	Lake Superior. Per gross ton Lower Lake Ports.	
	Mesabi, Non Bessemer, 51.5% Fe	\$ 9.05
	Mesabi, Bessemer, 51.5% Fe	\$ 9.20
	Old Range, Non Bessemer	\$ 9.30
	Old Range, Bessemer	\$ 9.45
MANGANESE ORE:	Metallurgical grade, 46 to 48% Mn, Long ton unit ...	\$1.15-\$1.23
	Chemical grade, 80% MnO ₂ . Per ton	\$70.00
	Chemical grade, domestic, 70% MnO ₂ , F.o.b. mines	\$45.00
	U. S. Government ore purchasing depots: Deming, New Mexico; base price \$2.30 per long dry ton unit of recoverable manganese less handling and treatment costs. Wenden, Arizona; base price of \$8.54 per long dry ton of 15% manganese ore. Butte, Montana; base price of \$6.05 per long dry ton of 12% manganese ore. Phillipsburg, Montana; base price of \$6.43 per long dry ton unit of 15% manganese ore. Metallurgical grade manganese ore program. Small lots f.o.b. railroad cars, minimum 40.0% manganese. Base price (48.0% Mn) \$2.30 per unit with premiums and penalties.	
MOLYBDENUM CONCENTRATE:	90% MoS ₃ . F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers	\$1.00
TUNGSTEN CONCENTRATE:	60% WO ₃ . Per short ton unit	\$65.00
URANIUM ORE:	Carnotite-Roscoelite. F.o.b. purchase depot plus \$0.06 per ton mile (\$6.00 maximum), Grand Junction, Rifle, Durango, Naturita, and Uravan, Colorado. Salt Lake City, Marysvale, Thompsons, and Manticello, Utah. Shiprock, New Mexico. Base price for 0.10% ore is \$1.50 per pound and up to \$3.50 per pound of contained U ₃ O ₈ plus \$0.75 per pound for each pound in excess of 4 pounds per short dry ton and an extra allowance of \$0.25 per pound for each in excess of 10 pounds. A \$0.50 per pound development allowance paid on all ores purchases. At shiprock all ores with more than 6% lime are penalized for excess lime. Carnotite-Roscoelite. V ₂ O ₅ in ratio of more than 10 parts to 1 part of U ₃ O ₈ are generally acceptable at all AEC depots, but excess not paid for at Marysvale, Manticello and Shiprock.	
VANADIUM ORE:		
NON-METALLIC MINERALS		
BENTONITE:	Minus-200-mesh. F.o.b. Wyoming points. Per ton in carload lots	\$12.50
	Oil Well grade. Packed in 100 pound paper bags	\$14.00
FLUORSPAR:	Metallurgical grade. 70% effective CaF ₂ content per short ton F.o.b. Illinois-Kentucky mines	\$42.00-\$43.00
	Acid grade. 97% CaF ₂	\$60.00
PERLITE:	Crude: F.o.b. mine per short ton	\$3.00 to \$5.00
	Plaster grades. Crushed and sized. F.o.b. plants per short ton	\$7.00 to \$9.00
	Concrete grades. Crushed and sized	\$6.00 to \$8.00
SULPHUR:	Long ton, F.o.b. Gulf Coast mines	\$22.00

Quotations on metals and certain ores through the courtesy of *American Metal Market*, New York, N.Y.



What's ahead for you?

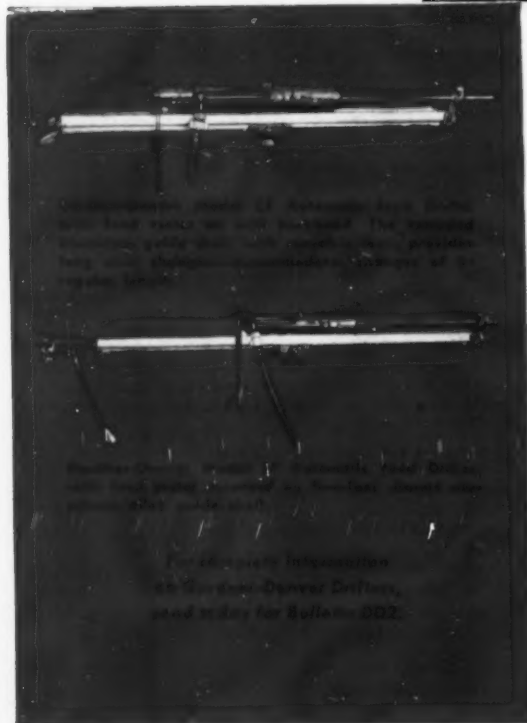
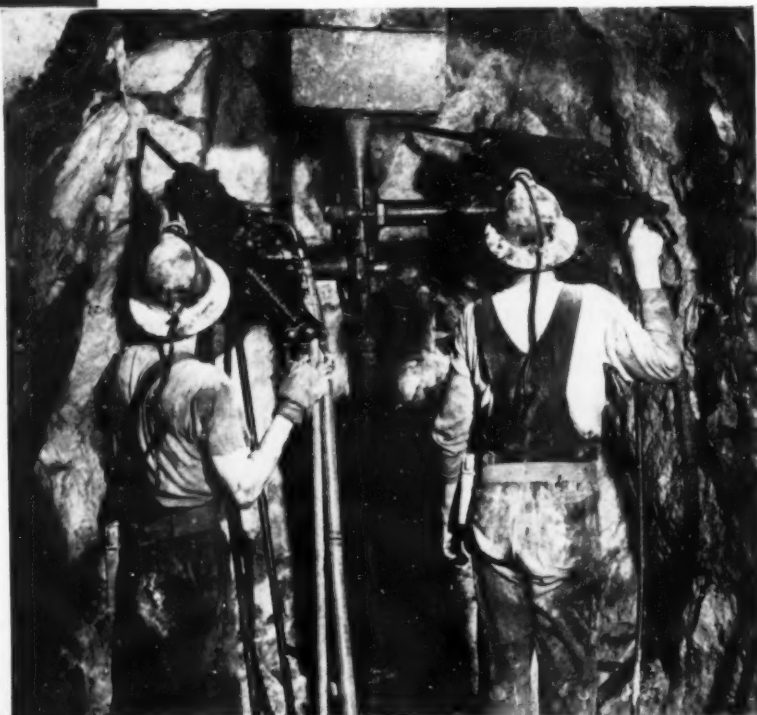
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for ore production
from your mine?

A stepped-up
development program
to reach your ore reserves?

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"hole through" in a hurry?

A program
to hold down
production costs?

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ENGINEERING BOOKS:

Views and Reviews

GOLD METALLURGY ON THE WITWATERSRAND.

By A. King. Transvaal Chamber of Mines, Johannesburg, Union of South Africa. 1952, 458 pages, cloth bound, 55s 6d (\$8.00).

Mr. King, formerly consulting metallurgist, New Consolidated Gold Fields, Limited has arranged and edited the book. Leading metallurgists, and geologists have authored the various sections.

The publication of this most complete, detailed, and accurate work on the metallurgy of gold may be considered as of the greatest importance at this time. The new gold mills in the Orange Free State have once again focused the metallurgists attention on gold.

The hundreds of detailed drawings, flowsheets, tables, charts, and diagrams should be of great value to mill men in all parts of the world. Data on equipment performance, steel consumption, and grinding data are among the most complete published. The record section is particularly detailed.

Chapter titles are: Geology of the Witwatersrand, Sorting and Crushing, Tube and Ball Milling, Recovery of Gold By Gravity Concentration During Grinding, Sand Treatment, Slime Treatment, Precipitation of Gold From Cyanide Solutions, Refining of Bullion, Smelting of Gold Bearing Byproduct Material, Notes on Sampling, Tonnage Determination, Control, Plant Layout and Records, Chemistry, Pumping, and Accidents.

GEOLOGIC GUIDEBOOK OF THE SAN FRANCISCO

BAY COUNTIES. By 28 contributing authors. Published as Bulletin 154 of the California State Division of Mines. 1952, 392 pp., cloth bound, over 300 photographs, drawings, and maps. \$2.50.

The natural features and factors that helped the area attain its eminence are the subjects of the guidebook. Of the twelve counties treated, nine (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma) border on the shores of the San Francisco Bay, and three (Sacramento, San Joaquin, Yolo) are in the delta region of the San Joaquin and Sacramento Rivers, yet all twelve unite to form one large unit, naturally, historically, and industrially.

Thirty-two authoritative articles comprise the book. Each was prepared by a technical expert, yet they are written in an easily understood manner, and are grouped into seven logical parts, including, "Historical background," "History of the landscape," "Geologic history," "Prehistoric life," "Mineral industry," "Water," and "Places to go and routes to travel."

MINERAL FORECAST 2,000 A. D., By Edward Steidle.

The Pennsylvania State College, State College, Pennsylvania. 1952, 216 pp., \$3.00.

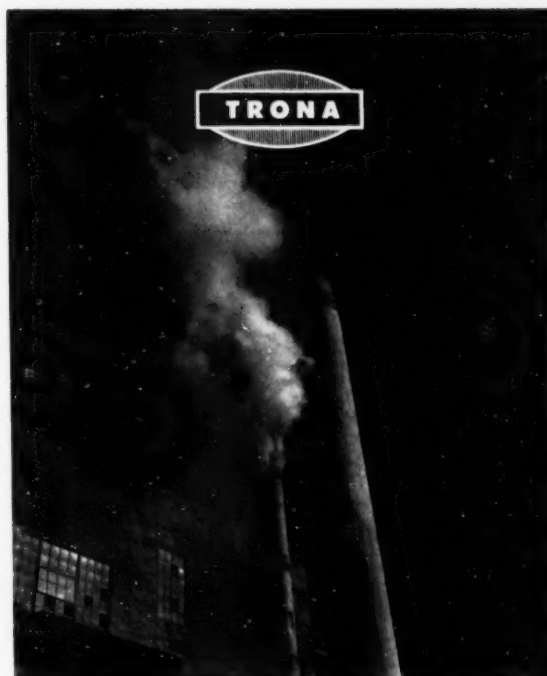
This is a new book in its field. It outlines the urgent need for conservation of minerals, for down-to-earth mineral policies, for a Federal Department of Mineral Industries with a Secretary of Cabinet rank, and shows how education and research can point out new resources.

The author prophesies that mineral preparation technologists will be indispensable in 1975, and geochemists and geophysicists in the year 2000.

Copies of any of these books may be purchased from *Mining World*, 121 Second Street, San Francisco.

OCTOBER, 1952

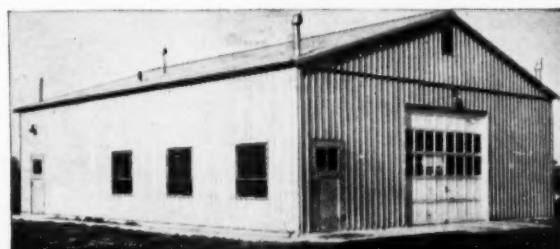
[*World Mining Section*—59]



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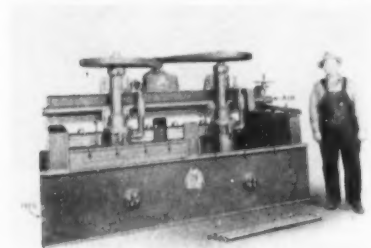
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Colonia Chapultepec Morales
Mexico, D. F.

PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD'S way of making available to you some of the finest current information on mechanization.

New Denver Sub-A Super Cells Offer Flexibility

Denver Equipment Company's new super rougher flotation machine is now in quantity production. This new machine, designed for roughing and scavenger flotation, features low level froth overflow on both sides of the machine; an open type of tank for pulp flow and super



eration. There are two impellers on each shaft. The many features of flotation flexibility incorporated into the new Denver "Sub-A" super rougher flotation machine give the flotation engineer the tools he needs to meet changing ore characteristics.

The two-cell No. 24 Denver "Sub-A" Super Rougher Flotation Machine pictured here weighs approximately 4,900 pounds, and each two cells is powered by a 15 hp. motor.

Applications and detailed performance of the new super cells are yours by circling PEP No. 80.

Army-Tested Heiliner Scraper Now Available

Heiliner, equipped with a 13-yard scraper and powered by a 165-horsepower Cummins Diesel engine, are now available

Commercial models of the 2C5000 from the Road Machinery Division of the Heil Company. During the past



year the units have been built exclusively for the Corps of Engineers, United States Army.

Features include Heil's Hydro-Steer, unobstructed visibility, big, safe, heavy-duty 2-shoe air brakes synchronized on both the tractor wheels and the trailing unit wheels, and loaded speeds up to 25 miles per hour. Circle no. 77.

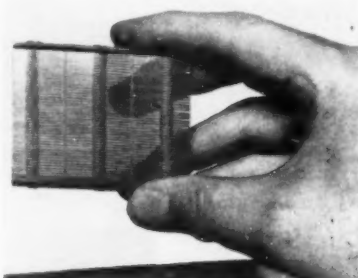
80

Double Open Area In Wedge-Slot Screens

For processing fine materials, the Hendrick Manufacturing Company has developed a new Wedge-Slot Screen that has at least double the open area of any other type of dewatering screen.

It is made with stainless steel bars, much smaller than ever previously used in a screen. These have a V-shape profile that is most effective for dewatering, drying, filtering, heavy media recovery, wet screening, and centrifuging. The bars are of two types: Type 10A for openings ranging from 0.004 to 0.04 inches; Type 15A for openings from 0.012 to 0.06 inches.

Slot spacings are uniform even with the smallest opening of 0.004 inch. To prevent distortion of slot width in screening irregularly shaped material or from vibrating screen action, the spacing between rivets is only 1 inch, instead of the 2½-inch spacing commonly used. An additional safeguard against mesh dis-



tortion during use is provided by special spacing lugs between the profile bars, which lock the mesh.

Further advantages of this new screen are yours by circling PEP No. 36.

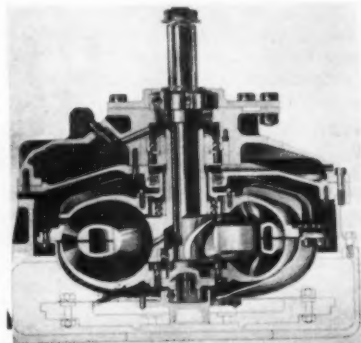
Converter Coupling For Safety and Economy

A new torque Converter Coupling which provides dual cost-saving advantages, plus new ease of operation for equipment used in the mining industry, has been announced by the Fuller Manufacturing Company.

During starting and pulling under load, the new Fuller Converter Coupling automatically provides up to 2 to 1 hydraulic torque multiplication, eliminating shock load on all component units of the drive line. During converter operation, the reaction member is locked to the housing through an overrunning clutch—changing the oil direction so that the thrust reaction is taken by the housing.

[World Mining Section—60]

With coupling, the problem of operator fatigue is sharply reduced since its ability to automatically match load demand with correct torque cuts shifting and clutching to the minimum. In addition, the smoother, gentler starts reduce



the danger of load-shifting, and minimize chassis and body strain.

The new coupling is designed to handle engines developing from 180 to 225 foot-pounds of torque at 2,000 to 2,200 rpm. or higher.

Full details are available by circling PEP No. 74.

Welding Electrode Holder For High Speed Production

A new lightweight 500-ampere electrode holder, model A-732 Tweco tong, has just been introduced by the Tweco Products Company. It features a light high-copper alloy for maximum conductivity. The raised upper lever provides ample room for the operator's hand. The body and tip ends are protected with patented, interchangeable insulators.

The holder will handle electrodes from 5/32 to 1/16 inch diameters. The welding cable may be soldered or clamped mechanically to the body of the holder. Only nine and one quarter inches long, the new holder makes it easy for the op-



erator to weld in those hard to get at places. It has been especially designed for high speed production, pipe welding and job shop work. For information, prices and specifications on this and other arc welding accessories, get Tweco's catalog no. 8 by circling no. 75.

MINING WORLD

LONG LENGTH CONVEYOR LACING: New compact bulletin just released gives data on applications to 96-inch widths and 3/8-inch thicknesses. Being continuous in length, these fasteners make a smooth joint of uniform tension across the full width of the belt. For your copy, circle PEP No. 1.

BECKMAN'S SPECTROPHOTOMETERS BIBLIOGRAPHY: Newest and latest information for users and those interested in spectrophotometric methods can be obtained free by requesting Bulletin 54-222 or circling PEP No. 2. Bulletin covers identification, analysis, and color measurements.

PLANNING PIPING LAYOUTS: This new bulletin describes standard and special Naylor fabricated fittings. Data includes specifications and prints on standard fittings for light-weight pipe. It also presents illustrations of special fabrications designed to save time and labor and reduce material costs in modernizing piping systems, according to the announcement. Circle PEP No. 3 for your free copy.

DIAMOND BIT FACTS AND FIGURES: Sprague and Henwood, Inc. have just published a fully illustrated bulletin containing detailed information about "Trucast" bits and the new "Trucast H" bit with an improved cast-metal matrix. The two new types—"Tufset" and "Rossett"—with powdered metal matrices are also described and pictured. Other information is given concerning drilling machines and accessories and may be obtained by circling PEP No. 4.

FLAME PHOTOMETRY DETECTION LIMITS are given in the new table for use with Beckman Models B and DU flame spectrophotometers. This new table lists in simplified tabular form such elements as the most useful wavelengths for flame photometry detection of such elements as barium, boron, calcium, potassium, sodium, manganese and many others. All interested in flame photometry may obtain a copy of this data sheet, form 54-2, by circling PEP No. 5.

INDUSTRIAL DUST COLLECTOR: The Sly Dynaclone is now available after many successful field installations, made over a period of several years, in a wide variety of applications. It is a cloth type filter for

collecting industrial dusts from various operations and removing collected material by reversing the air flow. For bulletin No. 101, circle No. 6.

INDUSTRIAL PUMPS FOR EVERY PURPOSE: The new catalog of the Nagle Pumps, Inc. describes the complete line of Nagle pumps, including the new "TW" and "AW" series. Specific operating aids are priming data, priming inductors, types of impellers, materials of construction, methods of drive, and design modifications. Complete dimensions, "cut-away" drawings of all pump types, capacities, and heads for all pumps make this catalog a complete reference work on pumping. Get your copy by circling PEP No. 7.

SCOOP SHOVEL FOR LOW HEIGHT MINE WORKINGS: The Thew Shovel Company has developed a new Scoop Shovel with a boom only 8.5 feet long. It has a 1 1/4-yard-capacity bucket for maximum loading capacity. Depending on the position of the boom, the machine can load (1) on down grade, (2) on the level, or (3) on an up grade. The bucket loading is essentially horizontal skimming and the bucket can be pushed straight out at any elevation, can be lifted vertically, or in any combination of the two motions. Get your scoop on this shovel. Circle PEP No. 8.

GRINDING, USING CARSET JACK-BITS: Ingersoll-Rand has published a series of illustrated wall charts designed to help you get in a better round faster and easier. Post one of these charts on every level to show your drill crews how to use these bits. The blacksmith shop will be especially interested in the charts on grinding and threading. The charts are yours by circling PEP No. 9.

LOWEST COST PER YARD MOVED is the feature of the complete line of Koehring excavators. The biggest profit advantage is yours when you use "Koehring Work Capacity" equipment. Full details by circling PEP No. 10.

TRUCO DIAMOND DRILL BITS: Each bit is set so that the diamond's utmost cutting power yields maximum footage at lowest cost. Circle PEP No. 11 for data about the "rib" setting of Truco diamond bits.

ALL-METAL BUILDINGS: To protect your equipment and supplies from weather and fire, Columbian Steel Tank Company offers prefabricated all-metal buildings for warehouses, engines houses, dry-houses, shops, garages, compressors houses, etc. A minimum of upkeep is required and sectional construction assures low-cost erection. For information, circle no. 12.

ROTOCURED BELTS LAST LONGER: Boston Woven Hose and Rubber Company's Rotocured flat transmission belts operate at lower tension and last longer. They give added belt life, eliminate mechanical distortion, have a constant uniform stretch, and have abrasion resistant covers. Circle PEP No. 13.

SUPER REFRACTORIES: If you are short on materials, don't delay construction. Substitute Super Refractories for want of heat resisting metals, resistance to abrasion or as a low-heat-capacity lining. For a copy of the booklet on the properties of Super Refractories, circle no. 14.

TIREX SHUTTLE CAR CABLE FOR RUGGED CONDITIONS: The geared design of Simplex-Tirex shuttle car cable gives longer life under more rugged conditions and will haul more tons of coal per dollar of cable cost. PEP No. 15.

BOYLES BROTHERS BLASTHOLE DRILLS are finding extensive use for both diamond core and blasthole applications. Circle PEP No. 16 for data on the new four-speed swivelhead drill, BBU "JV," which is recognized as the world's most powerful underground diamond drill of its size.

AUTOMATIC COUPLING FOR HAULAGE SAFETY: Ohio Brass automatic mine car couplers eliminate coupling hazards when joining mine cars. With perfect mating of the couplers, train men are not exposed to the between-cars danger area. For safe coupling data, circle PEP No. 17.

FOR AUTOMATIC WELDING machines, the Stoodly Company has developed a new tubular fabricated build-up wire. The Stoodly 104 wire was designed for a final overlay for certain types of tractor track rails, sheaves, mine car wheels, etc. Circle PEP No. 18 to see where this new rod can be used at your mine.

Circle numbers and mail this card for free product literature

To get further information on any item described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

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GASITE ALLOY FOR SLURRY PUMPS gives superior abrasion resistance to Georgia Iron Works Company's pumps. Get the facts on pumping finely divided highly abrasive pumps by circling No. 19.

IMPROVE BELT CONVEYOR PERFORMANCE at your mine or mill by selecting the right belt idler for your job from Hewitt-Robins Incorporated's Bulletin No. 142 which will be sent you if you circle No. 20.

EIMCO GEARED AIR MOTORS are available in three sizes, from 7.5 to 17.0 hp., each with four different speed ratios. The high starting torque motors will work efficiently on air pressures from 40 to 125 pounds per square inch. Circle PEP No. 21 for possible applications of these motors.

NOISELESS FREE FLOW WITH SYNTRON: The Syntron Company now manufactures a complete line of semi-noiseless electric vibrators for use close to workers where noise is a major factor. For a descriptive folder on these vibrators for bins, hoppers, and chutes, circle No. 22.

WATER LUBRICATED PUMP SHAFTS prevent wear in bore hole pumps for mine dewatering. The Johnston Pump Company has a pump for every purpose and features a renewable shaft sleeve in their turbine pumps. If you are pumping liquids, Johnston hydraulic engineers can help you. Circle PEP No. 23.

DESIGN YOUR REDI-FAB BELT CONVEYORS: The Barber-Greene Company has a new 40 page catalog which makes it easier for you to figure your own conveyor belt requirements. The selection of the proper conveyor with the correct size of drive and motor is assured. Using the new layout sheet you can make your own layout, accurate in every detail. Select your Redi-Fab conveyor and order the components from Catalog RF. Send for the Redi-Fab catalog by circling No. 24 and design your own conveyors.

VANO VENTILATION: Circle No. 25 to obtain data about cost-reducing blowers that give up to 100 percent more air. These are the propeller-type VANO for medium pressures in shorter pipelines, or the VENTAIR centrifugal blower designed for high pressures in long pipe lines.

TRUCK HOISTS AND BODIES: The new St. Paul Hydraulic Hoist booklet, describing new truck bodies and dumping hoists, compares St. Paul's added values with other bodies. Circle PEP No. 26 to get full details on "Bonus Capacity."

COTTRELL WHIRLCONC SEPARATOR: Actual plant experience proves that the Georgia Iron Works Company's Cottrell Whirlconc pays for itself in recovering valuable material in the 100-mesh range normally discharged to waste. Circle No. 27 for data on this separator.

HEIL TELESCOPIC HOISTS give double-acting truck body dumping at 70° angle for fast clean dumping of loads up to 50 tons. The hoist has a built-in snubber to prevent "kickback" or over-dumping with a sticky load. Circle No. 28 for more information.

CORROSION-RESISTANT INSTANTANEOUS READING TAPE: The Lufkin Rule Company has announced a new circular describing its "Royal" Ni-Clad series of tapes in lengths to 100 feet. The figures and gradations won't wear off, and the "Instantaneous" markings assure accurate reading at a glance. Circle PEP No. 29.

KARRY KRANE BOOMS FOR RESTRICTED SPACE: The Hyster Company is now building a series of special booms with four- to nine-foot overhang for use where operating space is limited. Each boom is available on special order only. For complete information about these special booms, circle No. 30.

THERMOID'S FIVE BASIC HOSES are described in the eight-page, four-colored book illustrating multi-purpose industrial rubber hose. This book will simplify ordering and stocking of many hoses, as it permits rapid selection of the right hose, for any pressure, with the recommended couplings. Get one for you mine warehouse. No. 31.

TRUCK SPECIFICATIONS AND OPERATING DETAILS AVAILABLE IN FRENCH: The International Harvester Company has just published a French edition of its truck catalog. Complete drawings and specifications for trucks of all sizes are given. Circle PEP No. 32 for a free copy.

HOW TO HAUL 21 CUBIC YARDS AT 28.2 MPH: The illustrated catalog of the Euclid Scraper gives complete information on the 275-hp. unit which has a 10-speed transmission and independently actuated hydraulic controls. Learn by circling No. 33.

RATCHET HOIST LIFTS 3,000 POUNDS: The new Coffing, hand-operated, ratchet hoist lifts up to 3,000 pounds. The load is suspended on a ratchet pawl at all times, cannot slip, nor will the holding mechanism freeze. The handle operates with partial or full strokes. Safety stops prevent spinning of the handle. For further information, circle PEP No. 34.

CENTRIFUGAL PUMP OPERATES IN EITHER DIRECTION: The new CAY pump of the Gardner-Denver Company pumps equally well when operated in either direction. Capacities of up to 67 gallons per minute at 50-foot head are available. Advantages are ease of installation, availability for any type of drive from motor on either side, and simplification of piping. No. 35.

LIGHT-WEIGHT PIPE FOR MINING: A new bulletin has been released showing typical applications of Naylor Lockseam Spiralweld pipe in the mining, construction, oil and related industries. For a copy circle No. 41.

NEW MOTORIZED HEAD PULLEY: Representing a new departure from conventional types of conveyor drives, this new motorized pulley is a fabricated steel drum, normalized to relieve stresses, with self-contained electric motor and reduction gears. The new Schrock unit will find application in mining, milling and crushing operations, where its compactness will reduce space requirements and its simplicity and mobility provides major time and labor economies. For detailed bulletin issued by Yuba Mfg. Co., circle 47.

FOUR-ARM TORQ THICKENER: 4-Arm feature providing continuous torq raking action makes lighter work of heavy ore tailings, reduces overload and eliminates danger of stalling and damaging the thickener unit. New Door Bulletin 3001 providing full details of this equipment may be obtained by circling 51.

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Safety Hatch For Diesel Locomotive Operators

Maximum safety for the operator, in the form of an escape hatch, was built into eight Diesel hydraulic locomotives by the Baldwin-Lima-Hamilton Corporation for The Carbon Limestone Company, Lowellville, Ohio. The 25-ton locomotives haul 5,500 to 6,000 tons of limestone a day from quarry to preparation plant almost two miles away.

For a considerable part of this distance, the track bed lies near the quarry working face and a derailment can send the locomotive toppling into the pit below. Hence, the need for an emergency hatch on the operators side for quick escape in case of accident. In moving trains back and forth, hatch always faces the bank side of right-of-way.

Each locomotive is powered by a six-cylinder, 190-horsepower Diesel engine operating through a hydraulic torque converter. The converter provides an infinite number of speed ratios between engine and driving wheels, and the hydraulic connection prevents transmitting vibration or shock loads from engine to drivers or vice versa. Acceleration is smooth, therefore, and there is no danger of stalling the engine on temporary overloads.

For further information on the safety features or hydraulic torque converter in these Diesel locomotives, circle PEP No. 73.

Denver Equipment Co. Introduces New Lab Dryer

A new portable laboratory dryer, incorporating the latest features of design and precise control of temperature and circulation, is offered by the Denver Equipment Company.

The compact, inexpensive dryer operates on single phase, 50-60 cycle, 110 or 220 volts A-C. It has an asbestos air-cell insulated oven using a pair of standard, easily replaced heating elements. This insulation, combined with tight construction, keeps the heat in the dryer oven. Power consumption is low—generally less than five cents an hour. Since no heat escapes, the room is not made uncomfortably hot.

Exact temperature is maintained with a thermostat control that enables precise adjustments of temperature between 0 and 325 degrees Fahrenheit.

Proper humidity and drying conditions are maintained with a forced-air circulating damper on the back of the dryer. For further information circle No. 78.

"Plastic-Dot" Work Glove Outwears Canton Flannel

A saving of at least 40% to industrial users of canton flannel work gloves has been made possible by the application of an entirely new principle in their manufacture.

Plastic dots, permanently set into standard 10-ounce canton flannel, make the new glove outlast conventional canton flannel gloves of this type by more than two-to-one. In tests, conducted by the U. S. Testing Company, it was shown that the plastic dot fabric was much more resistant to abrasion. In the tests, the plastic dot fabric was able to with-

stand 4547 wear cycles as against 294 wear cycles for the 10-ounce canton flannel.

While the new "Plastic Dot" is slightly more expensive than the canton flannel



gloves, its lifetime is twice as long. For information on obtaining these gloves manufactured by the Riegel Textile Corporation, circle No. 72.

Truck and Trailer Bodies Dump Both Right and Left

A new line of side dump truck and trailer bodies for heavy duty applications are available from the Galion Allsteel Body Company.

Entirely mechanical in operation, Galion Roll-Overs dump to either the right or the left side, as desired. The units are built of 10 gauge steel, can be mounted on all standard semi or four-wheel trailers, and will withstand the most severe service.

The self-contained subframe consists of three heavy box type outrigger cross



members. Front and rear outriggers are built with a series of gear-like teeth which roll inside the formed channel tracks welded to the body. This construction locks the body in a stationary position and prevents forward or backward movement of the body on the frame. Circle no. 71.

New Koehring Subsidiary Organized at Chattanooga

The Koehring Company of Milwaukee has announced the organization of another subsidiary, the Koehring Southern Company, formed to provide increased facilities for the development and manufacture of new models of Koehring power shovels and cranes. At a cost of about \$500,000, the new company purchased the Chattanooga, Tennessee plant of the Norge Division of Borg-Warner Corporation.

The property consists of a modern factory with a total floor space of 100,000 square feet, including auxiliary buildings. Located on a 17-acre site on Manufacturers Road, the plant is served by rail, water and highway transportation. Koehring Southern plans to spend \$1,000,000 to equip the huge building. Full production is scheduled to begin early next year.

Notes from the Manufacturer

J. Gilbert Miller, resident manager of Westvaco Chemical Division of the Food Machinery and Chemical Corporation, Pocatello, Idaho, was recently named manager of sales development for the firm. Mr. Miller, who will work mainly in the West, has been succeeded by Josiah Work, former production manager at Westvaco's electric furnace plant at Pocatello.

Alaska Limited, a new mining and construction equipment company, has been formed by Joe V. Thorne and Dick Jameson. The firm will operate offices in Fairbanks and Anchorage, Alaska, for the sale of wholesale equipment, generally with emphasis on tires, cables and tractor parts.

W. H. Lauder, branch manager of the Cummins Diesel Sales Corporation, has moved into the company's new building on Highway 169, west of Hibbing, Minnesota.

John G. Montag, former export sales manager of Trackson Company, Milwaukee, Wisconsin, is now export divisional manager of Caterpillar Tractor Co., Peoria, Illinois. The Trackson Company recently became a wholly owned Caterpillar subsidiary. Montag's immediate responsibility will be the integration of Trackson orders and shipments into Caterpillar's operation.

The Industrial Rubber Goods Sales Division of Raybestos-Manhattan, Inc., has announced the appointment of Harold H. Burrows as sales manager. Burrows is the former manager of the roll and tank departments.

John P. Courtright has been elected president of the Marion Power Shovel Company, Marion, Ohio. He succeeds Harvey T. Gracely, forced by illness to assume an inactive status in the company. Other new officers are Adrien F. Busick, Jr., vice president in charge of engineering, and Maurice V. Cornell, vice president in charge of sales.

Harbison-Walker Refractories Company has announced the appointment of Miro Mihelich as manager of Harbison-Walker Minérios, Ltda., a subsidiary company organized for developing sources of raw materials in Brazil. Mihelich has been in the mining department of Harbison-Walker since 1947.

National Malleable and Steel Castings Company Cleveland, Ohio, recently bought the Capitol Foundry Company of Phoenix, Arizona. National Malleable will spend more than \$1,600,000 to build a new foundry there to produce cast steel grinding balls for the mining industry that will have an annual capacity of 25,000 tons. Engineering plans are also underway for a casting plant on the same site which will produce a line of castings of various ferrous alloys.

National Malleable has also announced construction plans for an Engineering Laboratory and Railroad Proving Ground at Cleveland for advanced physical testing of their products and extensive engineering research. The new project is under the direction of Kenneth L. Selby, chief engineer, railway division.

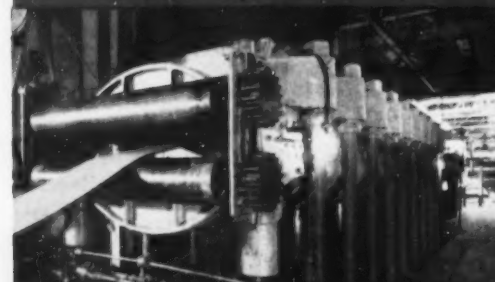
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Tonopah Development Cuts High-Grade Silver Vein

A vein of undetermined extent has been exposed by the Tonopah Development Company at the Summit King mine north of Tonopah, Nevada. The ore reportedly assays better than \$50.00 per ton in the ratio of 100 parts silver to one part gold.

The 8- to 10-foot-wide vein was cut at the end of a 900-foot crosscut on the 300-foot level. Drafting westerly is under way along the vein. After two rounds, the vein had narrowed to three feet but high values continue with ruby silver showing on the footwall. Drifting to the east is not being undertaken at present because it is believed that the Halifax Fault displaces the vein some 50 feet from the crosscut.

If enough ore is developed, the possibility exists that the company will move the 70-ton cyanide plant from Summit Kings Mines, Ltd.'s Dan Tucker property near Fallon to Tonopah.

The property being prospected is owned by Calumet & Hecla Consolidated Copper Company and is under lease to the Homestake Mining Company and Summit King, who are participating jointly in the project as the Tonopah Development Company.

First Mineral Conference Scheduled in Southwest

R. S. Palmer, executive secretary of the Colorado Mining Association, will make the keynote address at the First Annual Southwest Mineral Conference to be held at the Alvarado Hotel in Albuquerque, New Mexico on November 6, 7, and 8.

Also scheduled for the first general session on the afternoon of November 6, are: Uranium Mining and Milling Developments in New Mexico, discussed by J. B. Knaebel of the Anaconda Copper Mining Company; Electronic Control in Mining and Milling, discussed by J. W. Picking, chief engineer of electronic and controls of the Reliance Electric and Engineering Company; and a talk on the future of potash by an official of one of the potash-producing firms in Carlsbad.

Earlier in the day, there will be a meeting of the resolutions committee, six motion pictures will be shown describing New Mexico's mining industry, and a welcoming luncheon will be held. The first session will close with a Grub Stake supper.

The second day will feature a discussion of modern techniques in mineral identification, with x-ray, spectographic and microscopic methods described by Dr. Carl Beck of the University of New Mexico, Dr. Robert S. Phelps of the Los Alamos technical staff, and Dr. Ming Shan Sun of the New Mexico Institute of Mining and Technology, respectively.

The geology of disseminated copper deposits will be discussed by B. S. Butler, Harrison Schmitt, T. M. Broderick, and Phillip A. Laylander. Representa-

tive Mills (D.-Ark.) will make a policy address at the noon luncheon.

At the third session, R. H. Jahns of the Department of Geological Sciences of the California Institute of Technology will speak on Rare Minerals in the Southwest. A panel will take up the subject of the effect of raw materials taxes on ultimate consumer prices, the effect of taxes on mine and mill operators, and a constructive tax program. At the evening dinner-dance, James H. Boyd, vice president in charge of exploration of the Kennecott Copper Corporation, will discuss Suggestions for an Improved Mineral Policy.

San Manuel and DMPA Sign Floor Price Agreement

A floor-price purchase contract for copper and molybdenum has been signed by the Defense Materials Procurement Agency and San Manuel Copper Corporation, Tiger, Arizona. This action completes the government's negotiations for the development of the huge San Manuel holdings, said to contain one of the largest copper deposits ever discovered in the United States. A loan of \$94,000,000 to assist in development of the property had previously been approved by the Reconstruction Finance Corporation.

The DMPA contract guarantees the company a market for 365,000 short tons of electrolytically refined copper and 16,060 short tons of molybdenum contained in concentrates. The guaranteed

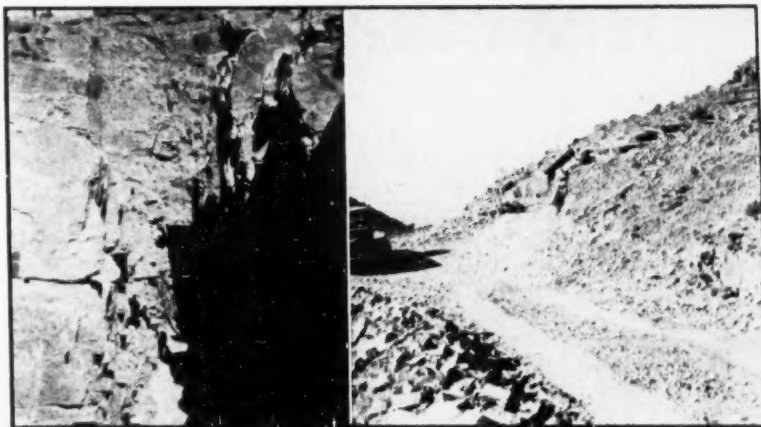
price for copper is 24 cents a pound, one-half cent under the present ceiling, and 60 cents a pound for the molybdenum concentrates.

As in other floor-price purchase contracts negotiated by DMPA, the government has an option to purchase the company's total output upon advance notification. It is expected, however, that most of the company's output will be sold directly to industry, stated DMPA Administrator Jess Larson.

Development of the San Manuel mine will involve, in addition to the equipping of the mine itself, installation of a mill and smelter, construction of a townsite, power plant, railroad connections and the installation of auxiliary facilities. The contract provides that the mine be in full operation in 4½ years, at which time production will be at the rate of 70,000 short tons of electrolytically refined copper and 3,080 tons of molybdenum concentrates per year.



The *St. Anthony Mining and Development Company, Ltd.* at Tiger, Arizona, expects to suspend operations about November 1. According to John A. Richards, manager, the present depressed metal market for lead and zinc, coupled



URANIUM DEPOSIT IN ARIZONA

About 200 tons of uranium ore has been mined and stockpiled at the Red Bluff group of four claims in the Flourine district of Gila County, Arizona, awaiting settlement of freight rates before shipment to a processing plant. All work to date is in open cuts like the one shown above. The uranium occurs as a finely disseminated impregnation in the upper member of the Dripping Springs quartzite. The uranium-bearing rock is confined to two layers, each 20 feet thick. The richest ore is along fractures, with some assays running over 3.0 percent. The predominating black uranium mineral is considered to be primary, probably uraninite or pitchblende, but so far has not been definitely identified. Small quantities of autunite, uranophane, and torbernite have been identified. The deposit is cut by a diabase dike. The property is owned by Ethel Schell Larsen of Globe, Arizona. Carl Larsen is in charge of operations.

GM DIESEL

CASE HISTORY No. 526-25

USER: Aurora Limestone Products Co.,
Aurora, Iowa, producers of road

stone and agricultural lime.

INSTALLATION: GM 3-71 Diesel powers a
 $\frac{1}{2}$ yd. Unit shovel, replacing a $\frac{1}{4}$ yd.
shovel powered by a gasoline engine.

PERFORMANCE: GM Diesel powered
shovel works faster, feeding
crusher about 17% more per day.

Fuel consumption averages
4 gallons per hour, saving 33%
on operating costs.



THIS DIESEL LOADS FASTER

and costs $\frac{1}{3}$ less to operate

A few days after Aurora put this shovel to work, they wanted a 2-cycle General Motors 6-110 Diesel for their portable crusher with the old 4-cycle Diesel was in the overhaul. Production increased from 280 tons per day to 300 tons. Fuel costs dropped from \$14.00 per 10-hour day to \$7.20. Now they say, the 6-110 now powers the crusher. With power on every piston downstroke, full accelerating GM Diesels enable

equipment to do more work each day. They're quick starting - easy to service and cost less to maintain. That's why users tell us "any machine with GM Diesel power is a better machine." Specify GM Diesels for your equipment.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS - DETROIT 26, MICHIGAN
SINGLE ENGINE 75 to 275 H.P. MULTIPLE UNITS 400 to 400 H.P.

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with the fact that excessive water has been encountered at the 1,125-foot level, is responsible for the decision to cease operations. The shut-down will affect about 190 miners presently employed by the company, although at the peak of operations as many as 450 men had been on the payrolls. The St. Anthony property was known originally as a gold mine. It entered the lead-zinc class in the mid-1930's and was one of the country's principal lead producers during World War II. Output this year has been at the rate of approximately 8,000 tons of ore monthly.

Miami Copper Company at Miami, Arizona, resumed mining operations on August 28 after a two-week shutdown caused when the shaft that drives the drums on the ore hoist was found to be cracked. A crew of approximately 50 men, working on a three-shift basis, installed the necessary spare part. The break-down caused the enforced lay-off of approximately 800 mine employees.

The Navajo Tribal Council has voted to put the tribe into the mining business on a tribal enterprise basis. A resolution was approved empowering the tribe to acquire its own mining or oil drilling equipment and to produce its own minerals. This would supplant the present arrangement whereby private companies lease tribal lands and pay royalties on their production. The next step depends upon the results of surveys now being conducted on the New Mexico-Arizona reservation by groups from the Universities of New Mexico and Arizona.

The Defense Production Administration has granted a certificate for rapid tax amortization to the Bagdad Copper Corporation of Bagdad, Arizona. The company is allowed to write off 75 percent of \$11,134,237 to be used in new copper-producing facilities.

Miami Copper Company reports that excellent progress is being made in preparing the Copper Cities Mining Company's property for production. The Copper Cities mine will take the place of the Castle Dome mine, with mill and plant equipment of Castle Dome to be moved to the Copper Cities location. Moving of the Castle Dome mill is expected to begin around October 1953 and to be completed around October 1954.

The Defense Production Administration has certified Bagdad, Arizona, as a critical defense housing area and has approved a privately financed project to construct 100 houses for defense workers. The units are to be single family houses to be built for sale. Of the 100 homes, 75 are to be two-bedroom at a price not in excess of \$6,000, and 25 may be three-bedroom not to exceed \$7,000. Thus the entire investment will run to \$625,000. Eligible for the housing are the in-migrant civilian defense workers at Bagdad Copper Company, Hillside Mining and Milling Company, Manhattan Consolidated Development Company, Black Pearl Mining Company, Consolidated Tungsten Company, Copper Queen and Copper King mines.

For the past year and one-half, the Oro Flame Mining Company has been developing and blocking out copper-gold-silver ore at the old Oro Flame mine, 12 miles south of Prescott, Arizona. It is now believed that sufficient ore is in sight to warrant mill construction, and plans for the milling plant are being made. In the meantime, development work and drilling are proceeding under the direction of H. K. Grove, mine superintendent. Seven men are employed.

OCTOBER, 1952



A strike of rich gold-bearing ore was reported at the Oriental mine near Alleghany, California. The find was located at the 2,000-foot level, and further explorations are being made to determine whether the ore is a pocket or a ledge that might continue for some distance. Dickey Exploration Company has operated the mine for about 16 years. The property is owned by the Drescher Estate of Sacramento, California.

A chrome refining plant is reportedly being erected by the United States Chrome Corporation on a site six miles north of San Luis Obispo, California. Ore will be mined by open-pit methods, milled to a grade of 48 percent chrome, and shipped to the government stockpile at Grants Pass, Oregon, and to steel firms in Japan. James Hartman and associates incorporated the firm in Nevada.

A \$400,000 bulk ore-loading facility is in operation at the Port of Stockton, California, with a rated loading capacity of 800 tons of ore per hour. Seventy gondola rail cars can be handled daily, and the stockpile area can accommodate more than 80,000 tons of ore between ships. Contracts have been signed for moving

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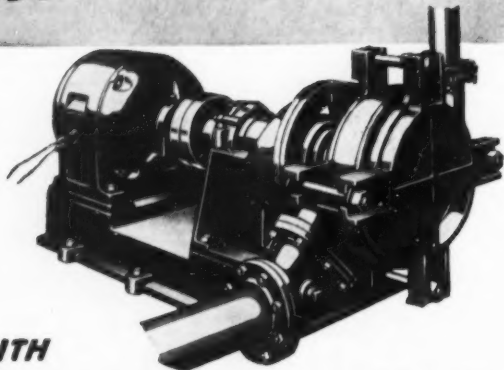
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425,000 tons of iron ore destined for Japan. When shipments reach their peak, an annual rate of 2,500,000 tons is expected to be handled by the Port.

Blue Ridge Gold Minex Company, Ltd. reports that its Hilton mine is shipping 25 to 30 tons of tungsten (scheelite) ore to the U. S. Vanadium Company's mill near Bishop, California. Preliminary work at the Tip Top tungsten mine is underway after clearing of the access road. The shaft is being repaired, in preparation for installation of hoisting equipment.

An order for 1,000 pounds of cobalt was filled by Bishop Silver Cobalt Mines, Inc. from its mine at Long Lake, Inyo County, California. The shipment went to a government testing station at Salt Lake City, Utah. Jack O'Brien, operator of the mine, expects it to produce at least 50 tons of cobalt, with a possibility of up to 250 tons.

Copper operations on the western shores of Shasta Lake in California may be resumed. Suits filed against the Federal government by the U. S. Smelting, Refining and Mining Company, and R. T. Walker of Salt Lake City, Utah have been settled, and the U. S. Bureau of Reclamation will begin construction of an 8-mile access road to the properties which were cut off when the Shasta Dam was constructed. As Shasta Lake began to fill, the old road was inundated, along with 2,600 acres of land belonging to U. S. Smelting. The government will pay U. S. Smelting \$70,000 for that land.

Sonoma County has become one of California's largest producers of mercury. The Dewey-Buckman and Culver Baer mines are relatively new operations, while the Sonoma Quicksilver Mines which operates the Great Eastern and Mount Jackson mines has been a foremost producer for many years. The Dewey-Buckman is owned and operated by Buckman Laboratories, Inc. Work is being carried on from an adit and open cuts. The Culver Baer, 16 miles east of Cloverdale, was rehabilitated last year by Carl Baumeister and L. A. Hulbert. The mine is equipped with a rotary furnace capable of treating 30 tons of cinnabar ore daily. Recovery is about 30 to 35 pounds of mercury per ton. Sonoma Quicksilver is producing about 250 flasks of quicksilver per month. Mining has been extended to the 975-foot level. Two Gould rotary furnaces treat about 130 tons per day.

Two new 150-ton Baldwin Diesel electric locomotives have been added to the facilities at Kaiser Steel Corporation's Eagle Mountain iron mine northeast of Indio, California. This brings the number of locomotives in operation there to four. The additional equipment cost about \$390,000, and will handle an increase of 50 percent in iron ore hauling operations. Increased ore requirements are for the company's third 1,200-ton blast furnace now under construction.



The Pershing County, Nevada, Chamber of Commerce says that iron mining in the area is seriously threatened by lack of sufficient gondola cars for shipping. The matter is being taken up with the officials of the Southern Pacific Railroad. Only about half the number of cars needed for the four iron mines in the

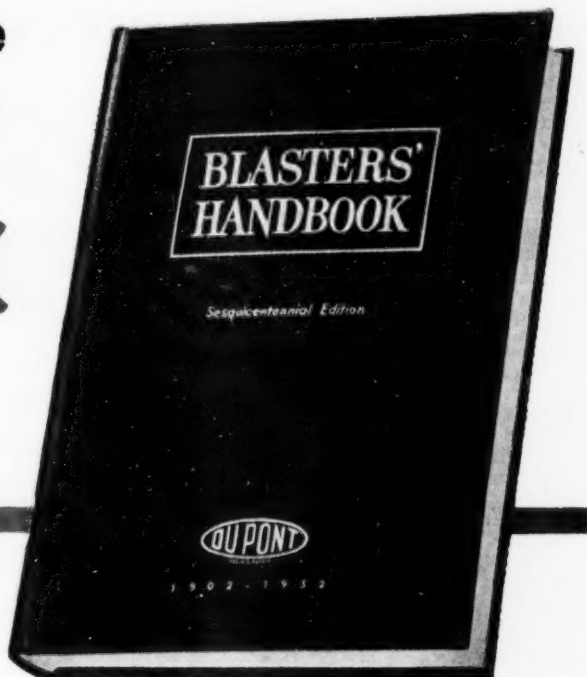
MINING WORLD

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Buena Vista Valley are being supplied, reports the Chamber.

Production is expected to begin soon at the *Castle Mountain* mine near Austin, Nevada. The mill will handle custom ore as long as it does not interfere with production from the mine. *Castle Mountain Mining Company* is operating the property. Values have been reported to be in silver.

The *Canadian Radium and Uranium Corporation* of New York reportedly has been awarded a right of exploration in the Searchlight area of Nevada.

Operations of the *Round Mountain Gold Dredging Corporation* in Round Mountain, Nevada, have been suspended indefinitely. All working and field personnel have been laid off until work is resumed. Pit operations have been under the direction of *Morrison-Knudsen, Inc.* since early last spring.

Scheelite ore with a 10 percent tungsten content is said to have been uncovered in the *Shafer* mine near Cherry Creek, Nevada. *Baltimore-Camas Mines, Inc.* which operates the mine reports that the vein varies in width from 18 inches to two feet and has been followed for a distance of about 20 feet. *Baltimore-Camas* has a 100-ton tungsten mill in operation at its property near Ely, Nevada, and is treating custom ore as well as that from its own mines.

The *Anaconda Copper Mining Company* has recently received three new five-cubic-yard, Model 1500, P&H electric mining shovels for use at its *Yerington* project in Nevada. More than 1,000,000 tons of overburden were removed during July.

Seven Troughs Mining Company is reported to be driving a tunnel in the Seven Troughs mining area of Nevada in the hope of contacting a continuation of a gold-silver vein found in the area in 1930. The tunnel has been driven 40 feet by hand drilling; a light compressor and machine drills have now been installed to complete the remaining 80 feet before the lateral is expected to reach the ore zone.



Construction of *International Minerals and Chemical Corporation's* magnesium oxide-hydrochloric acid plant at Carlsbad, New Mexico is well under way and may be in operation by next summer. Most of the foundations for the cleaning section have been completed, as well as those for the acid tanks, and the excavation for a huge hopper. Some new equipment has arrived for the mine. One hundred mine cars have been added, bringing the total now in operation to 300. A third jumbo drill has been received and readied for operation on the 900 level. Also on the schedule are two continuous miners and two surge cars. Both of these are new to IMCC's operations.

F. A. Stitton has sold his uranium claims in the Haystack Mountain area near Grants, New Mexico, to Thomas Skidmore of Grand Junction, Colorado. Mr. Stitton recently sold other uranium claims to the Navajo Uranium Company, subsequently sold to the Kerr-McGee interests of Oklahoma City, Oklahoma.

precipitates—ROCKY MOUNTAIN

ASARCO Planning 200-Ton Mill at Keystone Mine

The American Smelting and Refining Company will build a 200-ton-per-day differential flotation mill at the Keystone mine five miles northwest of Crested Butte, Gunnison County, Colorado. ASARCO is developing and operating the property under terms of an operating agreement with the Park City Consolidated Mines Company.

An extensive development program has blocked out zinc-lead-copper-silver ore in two veins for mill feed.

Preparatory to mill construction, a telephone line is being built from Crested Butte to the mine. Negotiations are being made with the REA to determine the feasibility of buying REA power. If negotiations are unsuccessful ASARCO will build and operate its own electric generating plant.

After the mill has been placed in operation, lead concentrate will be trucked to ASARCO's AV plant near Leadville, and zinc concentrate will be trucked to Salida for rail shipment to the company's Amarillo, Texas, zinc smelter. Gunnison County has agreed to keep the mine road free from the heavy winter storms so as to speed mill construction and mine operations. J. Fred Johnson, manager of Western Mining Operations, is manager of the project with Nolan Probst of Crested Butte as superintendent.

Second Mine Closing Hits Park City, Utah

The second of three major mining firms located in Park City, Utah, has shut down for an "indefinite" period. James B. Ivers, vice president and general manager of the Silver King Coalition Mines Company, said a drop in lead from 19 to 16 cents a pound and from 19% to 14 cents in zinc was responsible for the shutdown.

The first firm to halt operations was the Park Utah Consolidated Mines Company, which had been strikebound since June 26. Net income for this firm had dropped \$119,065 over last year during the six-month period preceding the strike. Paul H. Hunt, vice president and general manager, attributed the drop to lower metal prices and increased operating and developmental expenses.

The third major firm in the area, New Park Mining Company, is still operating. Approximately 575 men have been idled by the work stoppages.

Old Carter Mine Reopens After Decade's Inactivity

The Carter mine and mill near Ohio City, Gunnison County, Colorado, are again in operation after almost a decade of inactivity. Kanarado Mining Company now owns the historic mine, which brings the total acreage owned by this company in the Gold Creek area to

2,000. The Carter mill will be operated on a limited basis (50 tons a day) until "all the bugs are out," according to B. V. Warren, Kanarado vice president. Eventually the mill and mine will operate around the clock. Key features of the Carter mine are a cross-cut adit 8,800 feet long and a vertical four-compartment raise 1,135 feet high which connects with the Volunteer shaft workings.



Machinery has been installed and additional development is underway at the *Kansas City* silver-lead-zinc mine, which is located near Silverton, San Juan County, Colorado. When a truck road is completed, Mertz and Olsen will begin work on a known body of higher than usual grade shipping ore. Present plans call for working on a one-shift basis, with a second shift to be put on later.

A compressor and attendant equipment will be installed at the portal of the *Queen Anne* lead-zinc mine as soon as the road is cleared for heavy trucks. Work at the *Queen Anne*, which is in the Cement Creek district of San Juan county, Colorado, is under the direction of Bob Daniels. Ore will be mined from an upper level while development continues in a lower working.

Lead-silver-zinc ore from the *St. John* mine near Montezuma, Colorado is now being shipped to the Jeffrey mill in Montezuma. The Jeffrey mill also handles ores from the *Ida Belle* mine of Bill Kirschmer and Max Bunker. A recent shipment of ore from their property reportedly yielded some very excellent concentrates.

Six miles of access road to lead and zinc mines in the Eureka area of San Juan County, Colorado are being built by means of a \$21,000 grant from the federal government. The three roads, being constructed under the auspices of the Mines Access Roads agreement, will facilitate moving of strategic ores to market. One road is being constructed into Ross Basin; a second from Animas Forks to the *Gold Prince* mine is nearly finished; a third has been completed north from the upper workings of the *Scotia* mine to connect with the one being built to the *Gold Prince*. The latter project will allow transportation of concentrates or ore from the *Venture Leasing Company's* near-complete mill.

The *Bemrose Placer*, one of the historic producers of Summit County, Colorado, is again in operation. Bill Gray and Irving Maestas of Colorado Springs are sub-leasing the property, and have brought in two caterpillar tractors, a power shovel, three trucks, an electric welder, and a fixed trommel screen. Cleanups are being made daily and recoveries thus far are running at nearly \$3.50 a yard.

The *Hunkilori* and *Don Pedro* zinc-lead claims in the Montezuma mining dis-

trict have been leased from the *Snake River Mines, Inc.* by Mike and Pat Vinson and Fred Harris of Breckenridge, Colorado. No plans will be made for operation of the mines until extensive examination and development has been carried out. The group also acquired in the transaction a new mill which was constructed in 1948.

Ennis Cole and A. G. Tilton of Silverton, Colorado are developing lead-zinc production from the *May Day* mine, located on the Cement Creek side of Red Mountain, and are shipping to the custom mill of the *Shenandoah Dices Mining Company*. In addition, they are holding in reserve a known body of higher grade ore averaging about fifty percent lead, zinc, and copper.



Homestake Mining Company, the nation's largest lode gold producer, is exploring extensively for uranium in the Black Hills area of South Dakota and Wyoming, according to general manager Guy N. Bjorge. Three areas are being investigated, but the extent and grade of mineralization have not been determined. Land has been leased in Craven Canyon near Edgemont, South Dakota, the Lyle Griffith ranch near Carlile, Wyoming, and the Bailey ranch 3½ miles north of Aladdin, Wyoming. The company, which has headquarters in Lead, South Dakota, has staked claims on government land in the Carlile region, and has located and posted 80 acres of government land near the Griffith ranch. Airborne and ground work have shown radio activity in both areas, and early indications point to a high-grade ore. Homestake's leases run to December 31, 1953, with options to continue to lease.

The American Smelting and Refining Company has been named the U. S. Atomic Energy Commission's agent in the construction of a uranium ore purchasing station in Edgemont, South Dakota. Construction materials are being shipped in at present, and plans call for the erection of three prefabricated buildings and a large truck scale. Sampling and buying of carnotite ore, now being mined about 10 miles south of Edgemont, will be carried out at the station.



Garfield Chemical and Manufacturing Corporation will increase production capacity for sulphuric acid from 500 to 700 tons per day by mid-1953 at its Garfield, Utah, plant. The firm, a subsidiary of *American Smelting and Refining Com-*



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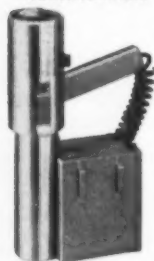
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pany and Kennecott Copper Corporation, will continue to supply the acid requirements of *Jr. R. Simplot Company* of Pocatello, Idaho, and plans to supply acid to a new company to be formed by ASARCO, Kennecott and the *Stauffer Chemical Company*. These sales outlets will use sulphuric acid in the production of treble superphosphate fertilizer, phosphoric acid, and other products. Garfield produces sulphuric acid through conversion of waste gases produced in the smelting of copper ores and concentrates.

The *Chemical Corporation of America* has begun rail shipments of sulphur from its new pilot flotation mill at Sulphurdale, Utah, according to C. R. King, mining consultant on the project. Test production runs have proven that the mill, which opened in February, can handle up to 200 tons of ore per day. The deposits average 25 percent, and proven reserves total 3,000,000 tons. If pilot plant operations prove successful, construction of a larger plant may begin next summer. W. D. Maycock is general superintendent of the mill and plant.

Combined Metals Reduction Company at Salt Lake City and *New Park Mining Company* at Keetley have reached agreement with the CIO United Steelworkers on new contracts for their lead-zinc mines and mills in Utah. The contracts will run from July 1, 1952 to June 30, 1954, with one wage reopener allowed after six months at New Park and one after a year for Combined Metals Reduction. No general wage increases were granted, except for a continuation on Wage Stabilization Board settlements for the 1951-52 period. Combined Metals made some minor changes, such as reduction from 20 to 15 years of the service requirement for 18 days' vacation.

Chief Consolidated Mining Company, producer of lead-zinc ore at Eureka, Utah also reached a settlement with the Steelworkers last month. Retroactive payments of 5 cents per hour will be made in cash, and an unknown balance will be paid from a fund consisting of 10 percent of the monthly profits. No fringe benefits were granted, and the previous contract was extended two years, starting on September 1, 1952. A wage reopener is scheduled for September 1, 1953.

The Defense Production Administration has issued a certificate to the *Utah Copper Division, Kennecott Copper Corporation* for rapid tax amortization of new defense production facilities. The certificate will cover 75 percent of \$1,377,000 worth of new mine equipment to be purchased for Kennecott's open-pit operation in Bingham Canyon, Utah. Other Kennecott activities include the formation of a totally owned subsidiary, *Bear Creek Mining Company*, to carry on exploration work in the Rocky Mountain area. Headquarters have been established in Denver, Colorado, and W. H. Burgin, field engineer, will be in charge.

The *Vitro Chemical Company* has completed its \$1,100,000 expansion program at its Salt Lake City uranium-vanadium plant, according to George White, vice president. This expansion permits the plant to process a maximum of 300 tons per day, but the regular operating rate is slightly over 200 tons. The plant is the largest nonvanadium uranium recovery plant in the United States, and is processing autunite and pitchblende ores from the Marysvale, Utah, district and other areas. The plant, however, treats carnotite-type ores from the Colorado Plateau. William B. Hall is plant manager.

Status of DMEA-Company Pegmatite Exploration Projects in South Dakota's Black Hills as of September 3, 1952

Company	County & Property	Minerals Involved	Status	Total Cost	Government
Jack Stewart & Carl Roseberry Custer, S. D.	Custer Gap Lode	Beryl, Mica	Not completed	\$ 15,760.00	\$ 14,192.10
Michaud & Stratton Custer, S. D.	Custer Mich Lode	Beryl, Mica Columbo- tantallite	Completed No Discovery	8,900.00	8,010.00
Lewis W. Collingwood, Custer, S. D.	Custer No. 9 Lode	Beryl, Mica	Completed Discovery Made	10,000.00	9,000.00
Black Hills Keystone Corp., New York, N. Y.	Pennington Sitting Bull	Beryl, Mica	Completed No Discovery	14,000.00	12,600.00
Black Hills Keystone Corp., New York, N. Y.	Pennington Bob Ingersoll	Beryl, Mica	Not completed	23,080.00	20,772.00
Keenan Properties Inc., Spearfish, S. D.	Lawrence Placer	Columbian, Tantalum, Tin, Tungsten	Not completed	100,000.00	90,000.00
Carl L. Wiehe & B. A. Gira, Custer, S. D.	Custer Tanner	Beryl, Mica	Completed No discovery	6,686.00	6,017.40
G. R. Campbell & Glenn Ventling	Custer White Top	Beryl, Mica	Completed Discovery made	6,550.00	5,895.00
R. H. McHenry, Buffalo, N. Y.	Custer Wiegie Group	Columbite Tantalite, Cassiterite	Completed No discovery	3,538.00	3,184.20
L. D. Pitts, Custer, S. D.	Custer Bruce Lode	Beryl, Mica Columbite Tantalum	Not completed	5,970.00	5,373.00
Mineral Mills, Inc., Custer, S. D.	Custer Glenwood Lode	Mica, Beryl	Not completed	1,200.00	1,080.00
TOTALS				\$195,693.00	\$176,123.70

MINING WORLD

precipitates—CENTRAL and EASTERN

Woodward Iron Installing Plant for Pyne Mine Ore

The Woodward Iron Company is installing a 400-long-ton-per-hour HMS plant to upgrade iron ore from its Pyne mine at Woodward, Alabama. The 10 by 10 foot Wemco drum separator will process 300 long tons per hour of minus 3-inch plus- $\frac{1}{4}$ -inch feed to yield 340 long tons per hour of sink concentrate.

A 26-foot hydroseparator and a 36 inch classifier will be used in the circuit to dewater the fines before HMS treatment.

New Minnesota Plant Will Up Manganese Output

Recovery of manganese from low-grade deposits on the Cuyuna Range in Minnesota will be made possible by construction of a \$2,000,000 processing plant near Riverton. Manganese Chemical Corporation will build the plant which will be able to treat at least 200 tons per day of manganiferous iron ores.

The Defense Materials Procurement Agency will advance up to \$1,500,000, to be repaid with interest as production gets under way. The government has also guaranteed to buy at a floor price any manganese produced under the contract that cannot be sold to industry in the United States.

Annual capacity of the new plant is expected to be about 456,000 long ton units, or about 10,214,000 pounds of manganese concentrate containing not less than 60 percent manganese. The contract covers a total production of 2,625,000 long ton units.



By mutual agreement, government financial assistance in the operation of the *Allouez No. 3* mine in Michigan has been suspended. *Calumet & Hecla Consolidated Copper Company*, owner of the property, reported discovery of a higher grade of copper ore which makes it possible for the company to operate the mine for a time without the price assistance agreement granted by the DMPA in a contract last January. The other three Calumet & Hecla mines also covered by the agreement will continue to operate under the over-ceiling prices.

The *Bilharz Mining Company* is proceeding with reinstallation of a shaft house and ore hopper at the *Muncie* mine, after fire destroyed most of the buildings, equipment, and machinery recently. The zinc-lead mine is located about 6 $\frac{1}{2}$ miles from Baxter Springs, Kansas.

The *Homestead Mining Company* has its 100-ton flotation mill partially erected, and has finished cleaning out

the Acme shaft. The company has leased 2,000 acres of mining land near Platteville, Wisconsin, on which are located the *Acme* and *Homestead* mines. Neither has been operated since 1914. The company is also sinking a new shaft on the Rasque orebody which is in virgin ground, and plans to clean out the Homestead shaft as the need for further ore develops.

The Reconstruction Finance Corporation has approved a \$54,000 loan for *New Diggings Mining Company* of Platteville, Wisconsin, to mine and mill zinc ore. The money is for improvement cost, and the purchase of machinery and equipment.

A U. S. Bureau of Mines crew is drilling on the old *Weyerhaeuser* copper property in Douglas County, Wisconsin, 14 miles east of Gordon, and 60 miles southeast of Superior. No significant production of copper has been recorded in Wisconsin, but the Douglas County deposits are believed to be similar in mineralization to the famous copper deposits in the northern Michigan peninsula. The Bureau crew will drill from two to four holes in the D lode area to substantiate the findings of previous industry drilling and to obtain enough core to determine the grade and extent of mineralization. Core will be tested in Bureau laboratories at Minneapolis, Minnesota.

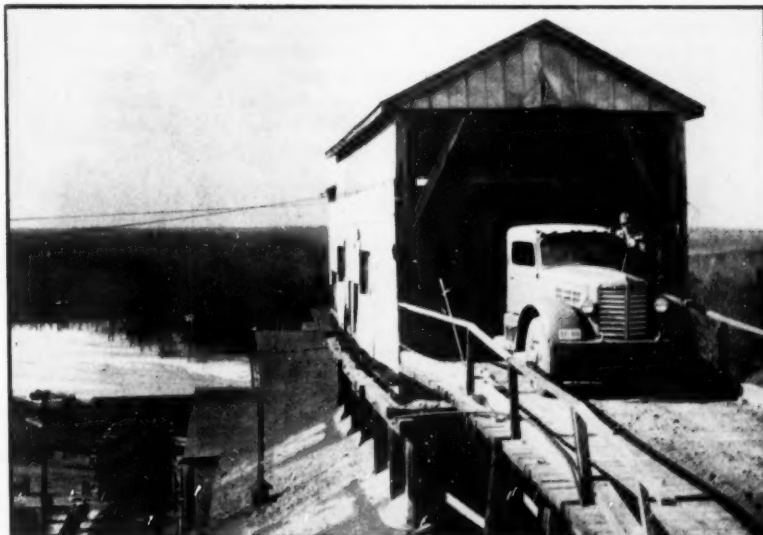
The *Westmoreland Manganese Corporation* has awarded a design and construction contract to the *Western Knapp Engineering Company* of San Francisco,

California, for a 250-ton-per-hour HMS plant to treat low-grade manganese ores from Westmoreland's mines at Cushman, Arkansas. A 4M modified Mobilmill will be the key unit in the new plant now under construction. In April 1952, the Defense Materials Procurement Agency advanced \$3,807,250 to Westmoreland to build the mill and to get it into operation within one year. Loan repayment will be made by delivery of 264,000 long tons of manganese concentrate in a six-year period. Initial DMPA payments for the concentrate will be at the rate of \$1.72 cents per short ton unit of manganese with payments being reduced to \$1.37 per unit after full-scale production is achieved.



Blaw-Knox Company has started construction of the large, modern lithium processing plant for *Foots Mineral Company* at Sunbright, Virginia. Operation is expected within a year.

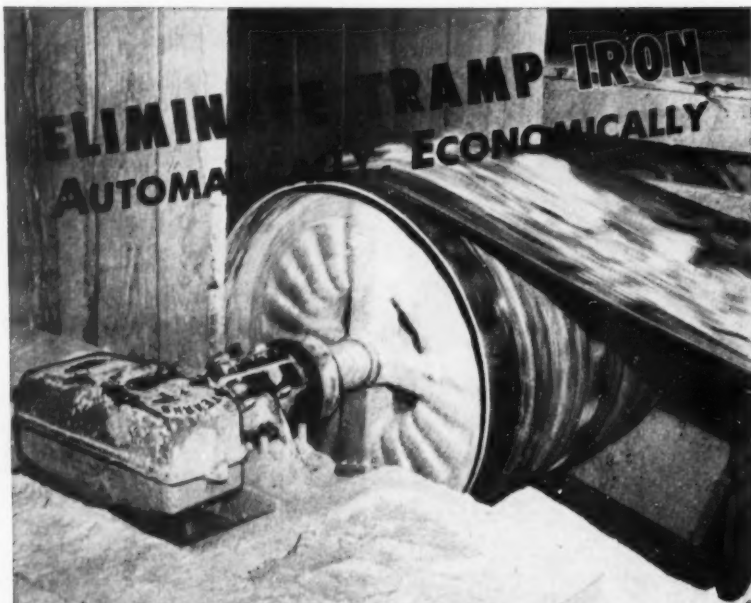
The *Carborundum Company* will build a \$2,443,000 plant at Akron, New York, for the production of rare metals. The company has formed a subsidiary, *The Carborundum Metals Company, Inc.*, to build and operate the plant. A



North Carolina News Bureau

TUNGSTEN MILL IN NORTH CAROLINA

The Tungsten Mining Corporation has completed its new crushing plant and the addition to its flotation mill at its Hamme tungsten mine in Vance County, North Carolina. The mill is now treating 600 tons of ore per day. In the picture above, the truck is dumping ore onto a rail grizzly which is set over the crude ore bin. The ore is trucked to the mill from the company's Sneed No. 7 and Central shafts. The mill tailing pond can be seen in the background.



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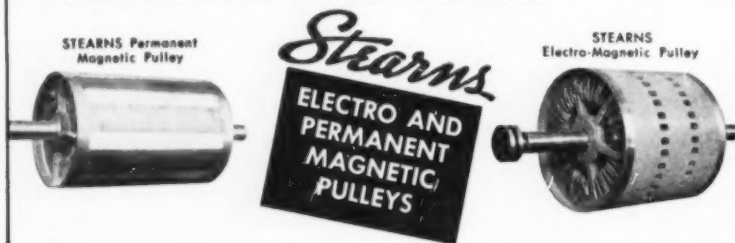
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contract with the U. S. Atomic Energy Commission provides for supply of 150,000 pounds a year of zirconium and hafnium sponge metals over a five-year period. Florida beach sands are the primary source for recovery of zirconium and hafnium as a by-product.

Rust Engineering Company is building the main plant for *International Minerals & Chemical Corporation's* uranium recovery project near Bartow, Florida. Included will be a towering 200 by 600 foot phosphate rock storage building. *Leonard Construction Company* is building the acid plant.

U. S. Steel Company plans to avert an iron ore shortage in its mills this winter by stockpiling all rail shipments of ore from the Mesabi Range. A total of 2,000,000 tons is scheduled for shipment to plants at Pittsburgh, Youngstown, and Chicago, with about 250,000 tons scheduled for delivery to the Ohio Works.

The Port of Mobile, Alabama, reports that the dollar value of iron ore shipped through customs in the first five months of 1952 is almost as great as total imports for the whole of 1950. Iron ore import value through May was \$2,365,915, while in 1950 imports amounted to \$2,530,252. However, actual long tonnage has increased very little. In 1950, 426,744 long tons were imported, while for the five months of 1952, 235,653 long tons were imported.

The Defense Production Administration has granted a certificate for rapid tax amortization to the *U. S. Metals Refining Company* of Cartaret, New Jersey. The company is allowed to write off 65 percent of \$174,200 to be spent for copper processing facilities.

A 2,500-ton shipment of iron ore from Cuba has been received at the *U. S. Steel Company's* new steel works on the Delaware River near Morrisville, Pennsylvania. This is the first of about 25,000 tons which have been sold to U. S. Steel. The new steel works is expected to go into partial production before the end of the year.

Industry sources estimate that this year's production of primary and secondary aluminum in North America may exceed the record aluminum output year of 1943—3,459,735,109 pounds. Based partly on record rates for the first six months of this year, estimates place the 1952 increase at about 200,000,000 pounds over the former record. Production would have been even greater if storms in June had not severely damaged nine potlines of the *Aluminum Company of America* at its plant in Massena, New York. This loss curtailed production by about 12,000,000 pounds.

A goal has been set for supply of chrysotile asbestos strategic grades. The goal, for domestic production plus imports for all purposes, is a rate of 6,000 short tons per year by January 1, 1954. This is 3,965 short tons over the supply in 1951.

Iron ore topped the list in the number of expansion projects approved by the Defense Materials Procurement Agency for the fiscal year ended June 30, with a total of 96 for a production expansion of 30,736,140 tons per year. A total of 436 projects were approved to boost domestic production of needed metals and minerals, involving an industry outlay of nearly \$672,000,000. Other projects included 53 for copper; 29 for ferro-alloys (chromium, cobalt, manganese, molybdenum, and tungsten); 92 for lead, zinc, and cadmium; 5 for tin; 3

for titanium; and 131 for a dozen or more non-metallic materials.

Representatives of four southern railroads have been meeting to discuss design and specification for a new type of ore car. The car is being considered for hauling of ore from the Port of Mobile, Alabama, to the blast furnaces of Tennessee Coal and Iron Division in Birmingham, Alabama. The ore will come from the Cerro Bolivar mines of U. S. Steel Company in Venezuela, and will be used to furnish 500,000 tons of additional steel annually. A modern ore terminal is being constructed by TCI at Mobile.

Development and installation of equipment at the North Friends Station mine in Tennessee has been completed by the American Zinc Company of Tennessee and mine production is up to 80 percent of rated capacity. The company reports that results are coming up to their fullest expectations.

The government is giving consideration to the problem of increasing the production and use of titanium. Presently, about 95 percent is used by the aircraft industry, and the price of mill products is about \$15.00 per pound. The principal problem in increasing use of titanium seems to be the prevailing price, and the only way to bring the price down is to increase production. Titanium production in the U.S. this year is expected to total about 2,000 tons, with 4,000 tons in 1953, 6,000 tons in 1954, and 8,000 tons in 1955. It has been recommended that the Army, Navy, and Air Force formulate an over-all program which would use the industry's entire current production at current prices. This is then expected to stimulate production and a more active market, with a resultant lowering of prices.



The Pioneer Mining Company has taken over the plant and equipment of the Stanley Mining Company which had operated the Mary Ellen mine at Biwabik, Minnesota. The Stanley company's operations terminated on December 31, 1951, when its ore reserves were exhausted. The Pioneer has acquired new reserves near the Mary Ellen and will continue to produce a high-grade concentrate. Its officers are Emmett Butler, chairman of the board; Patrick Butler, president; Frank S. Bergstrom, vice president; F. J. McArthur, treasurer; and F. J. McGinn, auditor.

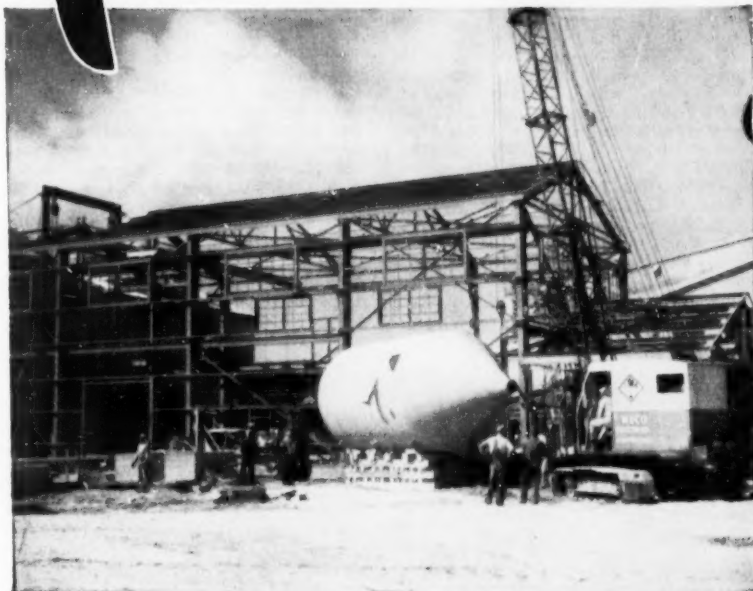
The St. James mine at Aurora, Minnesota, now operated by Oglebay, Norton & Company, re-entered the shipping list this spring after a 28-year shutdown. Previous to 1952, it had shipped a total of 2,680,830 tons underground with an estimated 4,482,377 tons remaining. Last shipment of 519,210 tons was made in 1924. The present open-pit mine is newly equipped with electric shovel, trucks for haulage, and a belt conveyor.

Ore vessels on the Great Lakes established a new record during the week of August 16 by hauling 3,280,094 tons of iron ore. The previous weekly record of 3,258,328 tons was made in August of 1943. The addition of new and larger ore boats to the fleet, and the high water level which prevails in the lakes, make

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still better records possible as the season progresses. Total 1952 shipments as of August 16 were 31,316,288 tons, compared with 53,131,894 tons for the same period in 1951—a reduction of more than 41 percent, which cannot be made up.

The Lake Superior Mining Institute, organized in 1893 at Iron Mountain, Michigan, is to be disbanded. The Institute's Council unanimously adopted a resolution to dispose of its remaining assets by contributing them to the Greater University Fund of the University of Minnesota for undergraduate scholarships in the School of Mines; and to the Alumni Foundation of the Michigan College of Mining & Technology for the Memorial Union.

Permits to prospect for iron ore on 58 mining properties in northern Minnesota were granted by the State Executive Council. E. L. Palarine of St. Paul was the high bidder on the Grant mine at Buhl, formerly operated by the Interstate Iron Company which shipped a total of 10,863,591 tons from the property. The Grant is estimated to have known reserves of about 700,000 tons, in addition to more than 1,000,000 tons of lean ore and paint rock, and about the same amount of taconite in stockpiles. Ray D. Nolan, director of the State Lands and Minerals Division, estimates that the ore, when shipped, will bring a royalty of from \$2.26 to \$2.86 per ton from this state lease. This is said to be a record

high for Minnesota royalty payments. Some old leases are still operating on a 12.50-cent royalty.

Other permits issued by the Minnesota State Executive Council were to: *Hanna Coal and Ore Corporation*, Hibbing, 14 permits, seven of which cover unexplored properties which are highly magnetic and are about 16 miles north of Nasjwauk; *Cleveland-Cliffs Iron Company*, Hibbing, 11, seven of which are on the Vermillion Range; *Erie Mining Company*, Cleveland, eight, all on the eastern Mesabi; *W. S. Moore Company*, Duluth, eight, all on the Mesabi, and one covering the *Bruce Annex* mine near Chisholm; *Ontario Iron Company*, Cleveland, five, including the former *Yates* mine and adjacent forties near Kinney; *R. Maturi Corporation*, Chisholm, four, three of which are on lean ore stockpiles totaling 116,000 tons; *Campbell Mining Company*, Cleveland, two; *Rhude & Fryberger*, two, covering the *Sullivan No. 2*, formerly operated by *Interstate Iron Company*, and an undeveloped unit; and *Cashen-Erickson, Inc.*, Virginia; *Iron Range Mining Company*, Cleveland; and *E. A. Young, Inc.*, Hibbing, one each. A total of 140 bids were submitted covering 73 mining units.

A new ore carrier which joined the lake fleet after the strike is the Johnstown of the *Bethlehem Transportation Corporation*. She will carry "in excess of 15,000 tons."

All-rail shipment of iron ore began in the Iron River, Michigan district on August 1 and soon was in full swing. A special pool of 8,000 to 10,000 gondolas was set up by the Association of American Railroads to handle a record all-rail ore movement. All shipments from the different ranges converged at the *North Western Railroad's* Butler yards in Milwaukee. Although the cost of all-rail ore is from \$1.75 to \$2.00 more than by the Great Lakes, the urgent necessity of shipping every possible ton before winter weather slows down the speed of ore handling, makes the extra cost of minor importance.

The *Chicago & North Western Railroad* has 90 new Diesel locomotive units on order for 1952 delivery, 32 of which had been received by August 1. The new locomotives range from 1,000 to 1,500-hp. per unit. Some of them are designated for iron ore haulage from the Gogebic Range to Escanaba, Michigan docks.

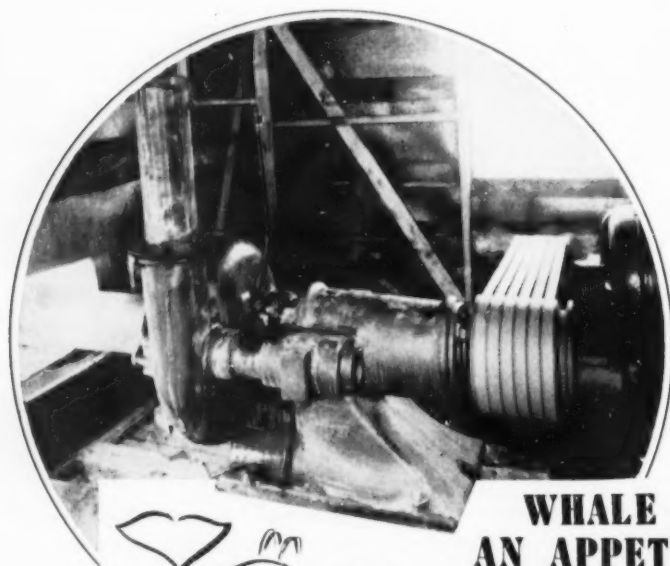
Oliver Iron Mining Division of U. S. Steel Company has had to delay its taconite pilot plant because of the strike by the ore miners. The new target date for full production is now set for the middle of 1953. It had been scheduled for 1952.

Minnesota's State Conservation Commissioner, Chester S. Wilson, has authorized *Pickands Mather & Company* to use 3,000 gallons of water per minute from Prairie Lake for its *West Hill* mine washing plant near the Prairie River. The order is for the months of April, May, and June 1953. The water will be pumped into a 50-acre clear water basin and returned there from the tailing pond for re-use.

The U. S. Bureau of Mines plans to build and to equip a Minnesota experiment station at Fort Snelling for research into the mining and processing of low-grade ores. Estimated cost is \$1,335,000. Iron ore, taconite, and low-grade manganese ores will be a major part of the project; but low-grade copper-nickel ore of northern Minnesota; copper from Wisconsin and Michigan; zinc-lead from Wisconsin and Iowa; lignite from North Dakota; coal of Iowa; sulfur from iron sulfides in Iowa and Minnesota; titanium of Minnesota; and various pegmatite minerals of South Dakota will also receive attention.

The *Cleveland-Cliffs Iron Company* has a new and modern lamp-house at its Mather "B" shaft in Negaunee, Michigan. It has a capacity of 696 R-4 electric hat lamps with 544 now in service. Reversible "self-service" racks are built on center pivots in one wall of a corridor between the change house and the shaft. On the opposite side of the wall is the lamp room where lamps are removed from the racks, inspected, and recharged. The charged lamps are then placed in slots on one side of the racks and the entire panel of racks is swung around to face the corridor where miners quickly and easily remove their individual lamps. This type of lamp distribution is said to have increased the speed with which miners can pick up or leave their lamps, and also provides positive control of distribution, charging, and maintenance of lamps.

The *Chicago & Northeastern Railway Company* has dismantled its old No. 2 timber ore dock at Ashland, Wisconsin. There are now only two ore docks remaining at Ashland: one of timber belonging to the Northwestern, and one of steel and concrete operated by the *Soo Line Railroad*.



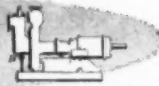
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Anaconda Ready to Build Montana Aluminum Plant

Anaconda Copper Mining Company has completed final arrangements for the construction of its proposed aluminum plant in Montana and work is ready to start.

The \$45,000,000 plant was originally planned for Kalispell, but local residents complained of the possible danger to crops and livestock. Although company officials said that these fears were unfounded, the location of the facility was moved to Columbia Falls in Flathead County.

Arrangements have also been made to obtain alumina needed for metal making from the Reynolds Metal Company's new plant at Corpus Christi, Texas.

Anaconda is financing the huge project privately.

DMEA Aids Lead-Zinc Exploration in Idaho

An all-out search for lead and zinc is under way in the Pine Creek area of Idaho, as three major companies undertake extensive exploration programs with the aid of the Defense Minerals Exploration Administration.

The second largest loan ever approved by the agency in the Pacific Northwest has gone to the Sidney Mining Company for \$200,290. Work will be confined to the northwestern part of Sidney's property, which is north of the producing Sidney vein. Electronic and geophysical examinations will be followed by 1,500 feet of crosscutting, 1,300 feet of drifting and 2,200 feet of diamond drilling. An additional 2,500 feet of drifting and 5,200 feet of diamond drilling are scheduled if the results justify it.

Spokane-Idaho Mining Company has undertaken a \$188,000 project at the old Douglas mine. The main incline shaft will be deepened an additional 200 feet on the vein. Plans also call for drifting 2,050 feet from the bottom of the shaft, and drifting 800 feet on a higher level. Since taking over the Douglas under a 10-year operating agreement last fall, Spokane-Idaho has unwatered and rehabilitated old workings, repaired the shaft headframe, installed machinery, and placed the property in production. Both mine and dump ore are being put through the firm's Constitution mill which is nearby. Brower Dellinger, formerly with Empire Star Mines in Grass Valley, California, has recently been appointed manager of mines and is in charge of operations.

A \$70,410 project has been started by Hypotheek Mining and Milling Company at the property it acquired from King of Pine Creek Mining Company. The contract calls for straightening and enlarging of a north surface tunnel, and extending of a 1,000-foot drift on the vein into unexplored ground. Up to 1,500 feet of diamond drilling will be done in the walls. Funds also are provided for exploring branching or parallel structures, and for purchasing a three-ton Diesel

locomotive, four new 32-cubic-foot mine cars, two used drifters, and used air compressor.



Cleanup work is under way at the Wilbert mine in the Dome district of Butte County, Idaho, one of the oldest lead-silver producers in the south central part of the state. Joe Bush and Leon D. Trenko of Seattle have leased the property which had been idle for two years. Construction of a 50-ton ball mill and flotation plant has also been started. *Homa Smith Company* will operate the mine; Troy Becker will be resident manager; and Charles Reamsnyder will be in charge of milling.

Lucky Friday Silver Lead Mines is preparing to sink a three-compartment offset winze from the 2,000-foot level of its mine near Mullan, Idaho. The new

shaft will be about 300 feet south of the main shaft and only 200 feet from the Lucky Friday vein. It will be sunk 200 feet and a new level established at 2,200 feet.

Lookout Mountain Mining and Milling Company has contracted with *Sunset Minerals, Inc.*, to drive an 1,800-foot crosscut from its 1,200-foot-shaft level to gain more than 1,400 feet depth below the lowest Lookout level. Three known base metal veins in Lookout ground are expected to be intersected by the work.

Idaho Custer Mines, Inc. has started milling lead-zinc mine ore at its Custer County, Idaho property following completion of dump milling started a year ago, according to C. Paul Grosenick, Seattle, president. A new 500-ton ore crushing unit has been completed and new mine equipment installed.

New Era Mines has retained Wayne D. Gould, metallurgist and mill superintendent for *Sunshine Mining Company*, to redesign its Pine Creek district flotation plant, and to up capacity from 150 to 250 tons daily. The mill had been treating *Signal Mining Company* ore



REOPEN REMOTE TUNGSTEN PROPERTY

The rough, wild, undeveloped area of the Apex and Wolframite Mountains near the Canadian border in Washington, is pictured in the aerial view above. (Note wing of plane in foreground.) It is easy to see why the mines in this district have been idle for so long. Border Lord Mining Corporation of Seattle has now leased the old German mine on Wolframite Mountain and renamed it the Boundary. Idle for 35 years, it is said to have been originally operated by German government agents who brought out 36 carloads of concentrates over a snow road. Miners now working on the property have been supplied by parachute with food, powder, caps, and tools. The firm is building a road to the property over the old "Tungsten Trail." In addition to the Boundary mine, the company owns the seven claims called the Border Lord mines, 1 1/2 miles south on Apex Mountain. These claims cover an extension of the series vein system, cropping out for a distance of three miles, that forms the Boundary deposit. The principal mineral is wolframite, with varying amounts of scheelite. The Boundary has been equipped with a 25-ton-per-day gravity concentration plant, to which Humphrey Spirals have been added. The mine has been opened by several adits with portals along Tungsten Creek, at elevations near 6,300 feet. The mill is built at the portal of the main adit, 565 feet in length. This portal is at an elevation of 6,800 feet; the peak of Wolframite Mountain reaches 8,300 feet. The company has applied for a DMEA loan of \$88,440 to do extensive underground exploration at the Boundary mine.

from the *Old Hilarity* mine. Signal recently halted milling and shipping until zinc-lead prices improve but is continuing development work. Plans include sinking from the 200- to the 400-foot level, according to Harry G. Alway, president.

Hunter Creek Mining Company has entered into an agreement with *Lucky Friday Silver-Lead Mines* for development of its adjoining 10-claim group from the 2,000-foot level of the *Lucky Friday* mine near Mullan, Idaho. The property has been idle since *Lucky Friday* explored its "Star" vein at the 1,400-foot horizon several years ago. The new agreement calls for crosscutting and drifting a minimum 1,000 feet. Costs will be shared equally. *Lucky Friday* will receive an additional one-fourth interest

in the *Hunter Creek* claims, giving it a one-half interest, according to Elmer Johnston, Spokane, *Hunter Creek* attorney.

A loan contract for thorium and uranium exploration in Lemhi County, Idaho, has been signed by the DMEA and *Defense Metals, Inc.*, of Kellogg. Exploration under the \$68,265 contract will be at the *Wonder* group of five claims, southeast of Salmon, Idaho, according to Lester S. Harrison, president and attorney for *Defense Metals, Inc.* *Silver Bowl, Inc.* holds a half interest in *Defense Metals*. Work will be directed by Robert H. Svendsen, mining engineer of Spokane and Kellogg. It will include 4,000 cubic yards of bulldozing, 3,000 feet of diamond drilling, 1,000 feet of drifting along a radioactive vein exposed in

an old tunnel, and the purchase of some additional mining equipment.

Hecla Mining Company has started preliminary surface stripping and trenching at the property of *Banner-Idaho Mines, Inc.*, near Mullan, Idaho, under an operating agreement signed some months ago. In accordance with a Spokane County superior court order, stockholders of *Banner-Idaho Mining Company*, a dissolved Washington corporation, have been asked to exchange their stock on a share-for-share basis in the new company. Shareholders should mail their old certificates to H. F. Magnuson of Wallace, assistant secretary of the new firm.

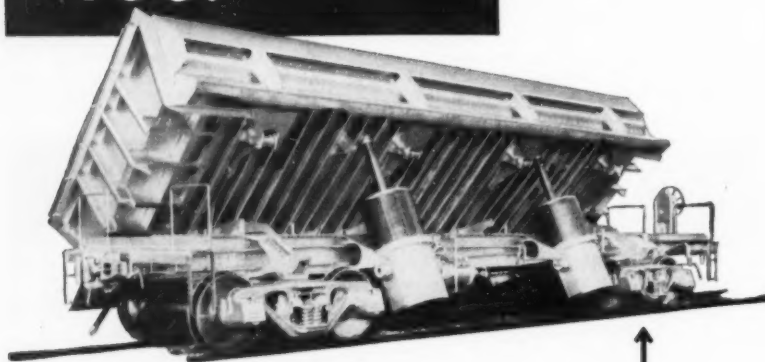
Nabob Silver-Lead Company is making shipments of zinc and lead concentrates from development ore taken from the ore body opened in the *Pine Creek* district property several months ago, manager C. C. Dunkle reports. High-grade ore of mineable width had been opened over a length of more than 400 feet at last report.

Idaho Custer Mines, Inc., *Custer County*, Idaho is changing over from milling of old mill tailing to milling of mine ore. A 500-ton crushing plant has been built, track and airline repairs made, and an air compressor and Diesel generators installed underground.

Hypothek Mining and Milling Company has deferred plans to sink a 50-foot winze on ore in the north surface tunnel of its *East Hypothek* property on *Pine Creek*, Idaho because a DMEA loan is pending. The winze project might possibly interfere with the program outlined in the DMEA application. Meanwhile, the company will diamond drill for the downward extension of an ore shoot opened in the south crosscut of the 900 level about a year ago. Since the area could be reached from the 1,100-foot level, that level is being repaired. The first drill hole will be as a continuation of the present drift and it is expected to encounter the structure within 100 feet. A second hole is planned from the present face to a point on the structure below where ore was discovered above. This hole will not be necessary if ore is disclosed in the first hole.

Sixteen additional temporary housing units have been assigned to the *Cobalt* area of Idaho, where newly discovered cobalt mines are swinging into production. Additional housing units have also been authorized for the *J. R. Simplot* fluor spar mines at *Meyers Cove*. *Simplot* has completed a new access road to its barite mine north of *Mackay*, Idaho, and has awarded a contract to *L. F. Heagle* of *Hailey* to haul 60,000 tons of ore. At the company's dredging project on the *Yankee Fork* of the *Salmon River*, operations have been completed and the dredge is being prepared for removal elsewhere.

BOOSTS EARNINGS TOO!



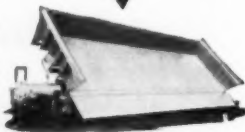
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SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT



W. R. Wade and H. G. Obendorf of *Marysville*, *Montana* have started work on a tungsten deposit at *Marysville*, showing several beds of good scheelite ore. A bulk sample from an outcrop reportedly assaying 4.7 percent WO_3 is being used for metallurgical and concentrating tests. The preliminary test work so far

has indicated that a plus 60 percent grade concentrate can be made by gravity methods. The scheelite occurs in metamorphic garnetized beds of the Helena limestone near the contact with quartz diorite. This tungsten discovery is near the famous old *Drumlummon* mine which has a past production record of \$23,000,000 in gold and silver. The Drumlummon mine has been operated during the past several years by W. R. Wade under the name of *Montana Rainbow Mining Company*, during which time an additional \$1,080,000 was produced.

Anaconda Copper Mining Company's production from the Kelley shaft of the Great Butte project in Montana recently reached 5,000 tons a day. Chester H. Steele, new vice president in charge of western operations, predicts that this rate will be doubled by the end of the year. Work will start soon on raising of a new service shaft near the main Kelley shaft which will free the supply compartment of the Kelley shaft for increased hoisting of up to 15,000 tons of ore daily. Grade of the ore is checking with previous estimates. Steel describes preliminary results of development of the Alice and Lexington areas as "most satisfactory," and says that work in the Elm Orlu-Black Rock area continues to prove and expand this section as a large low-grade zinc area with many years of possible continuous development. Large undeveloped parts of the Butte district are being investigated with "most encouraging results at numerous points."

The old *Iron Mountain* mine north of Superior, Montana, is yielding about 60 tons of zinc-lead-silver milling grade ore daily, reports E. G. Smith of Osburn, Idaho, the lessee. Ore is treated in the Nancy Lee mill west of Superior. Smith recently reported discovery of a high-grade zinc ore body near an old stope last worked in 1915. A 300-foot raise is being driven to open another zinc ore body left by early-day operators. Rehabilitation of the mine shaft, sunk 600

feet below the adit, and investigation of lower workings are planned.



The U. S. Bureau of Mines has reported opening two ore bodies at the Shamrock copper-nickel mine in Jackson County, Oregon, but to have found that the ore is not amenable to concentration into separate nickel and copper products. Ninety percent of the metals were recovered in a low-grade bulk sulfide concentrate. Additional tests were planned at the bureau's Northwest Electrodevelopment Laboratory at Albany to determine if the concentrate could be treated further by leaching. The bureau did 396 feet of drifting, 3,419 feet of diamond drilling, and 1,650 feet of bulldozer trenching at the property 28 miles northwest of Medford.

Paul Wise of Boise, Idaho, recently shipped a car of manganese ore from the *Sheep Mountain* mine in Baker County, Oregon, to *Ray-O-Vac Company* at Salem for processing into high-grade manganese oxide, used in dry batteries.

According to reports, W. G. Younce, limestone producer and contractor of Medford, Oregon, has moved heavy construction equipment to a property near Grants Pass and is stripping the overburden. Geiger counter surveys of the area indicated a high degree of radioactivity, and the exploration work will determine continuity and grade of the radioactive material.

The U. S. Bureau of Mines laboratory at Albany, Oregon, reports that one of the richest samples of uranium ore has been tested by them for Martin E. Oakes of Portland. The U. S. Atomic Energy Commission is interested in the find and whether the sample is representative of the deposit.

Tar Baby Mining Company has levied an assessment to finance annual assessment work at its *Musick* mine 35 miles east of Cottage Grove, Oregon, according to Burt M. Slusser, secretary. Company officials believe production may get under way this year by lessees. Corvallis, Oregon interests have purchased operating control of the firm. President is William E. Caldwell, professor of chemistry at Oregon State College. Kenneth O. Watkins is vice president.

The City Council in Springfield, Oregon has agreed to spend \$10,000 to encourage the *Apex Smelting Company* of Chicago to establish an aluminum reduction plant in the city. The council plans to contribute the money toward purchase of an 18-acre site now owned by the Oregon Fibre Flax Growers Association.

Tungsten occurring as scheelite in a contact-metamorphic rock has been discovered on the Hall property about 1½ miles from Ashland, Oregon. An ore zone about 2½ feet wide has been exposed in a small open cut. About 10 tons of ore has been mined and is now being milled to determine its grade.

Attempts are being made by Fay Bristol, president of the *Oregon Mining Association*, to have the *General Services Administration* keep the Grants pass stockpile and purchasing depot open for longer hours. This would help to increase the supply of chrome ore brought in. Repaving of the depot area is under way, and the property may also be fenced.

Eugene Brown, who shipped at a loss along with Dorothea Moroney of Klamath River during the Thirties to prove to the nation that chrome existed in the West, has now shipped over 14,000 tons of high-grade ore. He is reported to have enough ore blocked to ship the 2,000 tons he wishes to market this year. The property is being diamond drilled.

New work is being carried on at the *Bonanza* quicksilver mine in Douglas County, Oregon. The operations are at both the north and south ends of the orebody. A new stope has been developed above the 700 level at the north end. A new condensing system is also being installed, and with no shutdown in production.

Gold placer operations have been resumed by *Pedro Brothers* of Huntington, Oregon on Connor Creek in Baker County. Their equipment includes a ¾-yard power shovel, bulldozer, truck, and sluices.

Recent developments in Oregon's chrome mining: Josephine County is making improvements on the Galice road between Hellgate Bridge and the Chrome Road Junction, in preparation for anticipated heavy ore movements and log hauling; a small concentrating mill is being installed at the *Sourdough* mine in Curry County, owned by Baker and Bristol; a lens of chromite has been exposed on the *Lucky Star* claim, near the *Oregon chrome mine*, by E. K. McTimmonds of Selma; Carl Anderson is reported to be doing exploration work at the *Red Dog Mining Company's* property in the Briggs Creek area near Selma; a road was completed to the *Mary Walker* chromite claim on Red Dog Creek from the Old Chrome Road. Lou Robertson is said to be mining at the latter claim.

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Gold Bond Mining Company has started investigating the old "nickel ledge" at its property in the Blewett mining district of the Cascades, Washington for possible commercial nickel cobalt content, according to Frank Lilly, Spokane, president. Some gold is being milled from ore taken from the company's *Gold Dust (Pole Pick)* and *Gold Bar (Stoner)* mines but the management has been stressing development work in expectation of a higher price for the yellow metal.

Germania Consolidated Mines, Inc., has added a small ball mill and a flotation cell to its tungsten mill near Fruitland, Stevens County, Washington, to remove iron-sulphur from stockpiled table concentrates. An initial 300-pound drum of the up-graded fine concentrates was trucked to Spokane recently for shipment to *Kennametal, Inc.*, Latrobe, Pennsylvania. About one ton of coarser jig concentrates, running 69 to 72 percent tungsten, is being shipped monthly, according to E. I. Fisher, secretary-treasurer. Kennametal has asked the Spokane firm to make future shipments to its new Macro plant at Port Coquitlam, British Columbia.

Tungsten Mining and Milling Company of Spokane has started testing additional mill machinery installed at the old *Germania* mine near Fruitland, Stevens County, Washington, under a \$50,000 production loan from the Reconstruction Finance Corporation. Low-grade surface talus material is being treated. The mill has a 300-ton rating. Work also is well advanced under a \$34,650 exploration loan from the DMEA. The main adit has been rehabilitated and 300 feet of crosscutting done. Another tunnel has opened the "North" vein and a drift has been run in scheelite and wolframite, according to Paul H. Casey of Spokane, president and general manager.

Surface trenching at the Stevens County, Washington, property of *Columbia Tungsten Corporation* has disclosed a 20-foot-wide zone of scheelite and wolframite, with 6 feet of high grade, according to S. Harry Draper, Spokane, company president. The 15-claim property is in the Summit mining district, about 18 miles west of Addy.

Pend Oreille Mines and Metals Company has placed the second 800-ton unit of its new concentrator in operation, but capacity output may not be reached until the underground labor situation improves, according to W. L. Ziegler, general manager. The Metaline district property in Washington is short more than 100 production workers and, despite completion of the second section of an underground ore conveyor system, stockpiled ore has had to be drawn on to partially supply the new unit. The conveyor addition increases length of the system by 1,200 feet to a total of about 2,850.

Idaho Goldfields, Inc., has contracted with L. A. Thompson of Spokane, Washington to sink a short incline shaft on galena recently found a foot below the floor of the adit at the firm's property in Fourth of July Canyon, 52 miles east of Spokane.

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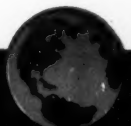
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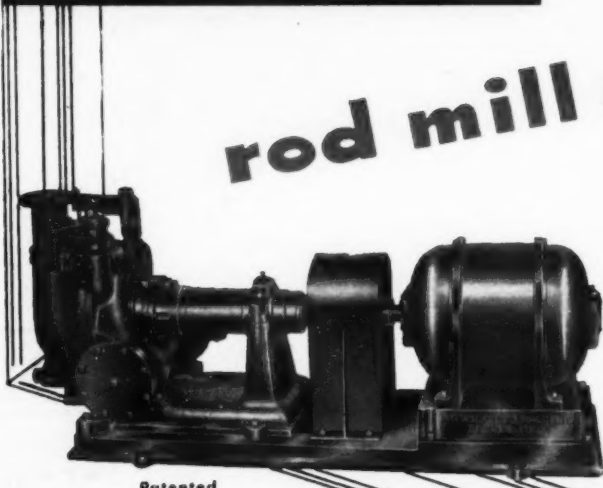
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